Ranger Rick's nature magazine

October 1970

PUBLISHED BY THE NATIONAL WILDLIFE FEDERATION

Worker bees gather pollen, mix it with honey and store it in cells for later use. **(See Page 39.)**

Photo by Ross E. Hutchins

EDITORIAL ADVISORY BOARD

Thomas L. Kimball, *Executive Director, National Wildlife Federation*

Dr. Wilhelmina Hill — *Coordinator for Environmental Education, U.S. Office of Education*

Robert Gilstrap — *Exec. Secretary, Dept. of Elementary, Kindergarten, Nursery Educ., National Education Association*

Dr. Edwin B. Kurtz — *Professor, Head of Dept. of Biology Kansas State Teachers College*

Edward Cliff — *Chief, Forest Service, U.S. Dept. of Agriculture*

John S. Gottschalk — *Director, Bureau of Sport Fisheries and Wildlife, U.S. Dept. of Interior*

John K. Vermette — *Principal, Bryant Woods Elementary School, Columbia, Maryland*

EDITORIAL STAFF

Trudy D. Farrand, *Editorial Director*

Robert L. Dunne — *Executive Editor*

Fred Johnson — *Associate Editor*

Margaret L. Poley — *Managing Editor*

Donna Sterman — *Assistant Art Editor*

J. A. Brownridge — *Senior Editor*

Barbara De Pena — *Art Assistant*

Sara Bulette Murphey — *Senior Editor*

Richard B. Fischer — *Contributing Editor*

Madeleine Livaudais — *Associate Editor*

James D. Davis — *Washington Editor*

Ranger Rick's Nature Magazine is published monthly except June and September by the National Wildlife Federation, Inc., a non-profit corporation. It is a membership publication available only to members and not sold on a subscription basis. Membership annual dues $6.00. Second class postage paid at Washington, D.C.

Copyright 1970 by the National Wildlife Federation, Inc. All rights reserved.

EDITORIAL OFFICES

Correspondence to the editors should be addressed to Publisher's Services, Inc., 1518 Walnut St., Philadelphia, Pa. 19102. Robert K. Farrand, President.

FEDERATION OFFICES

General Correspondence about wildlife stamps, nature merchandise, the National Wildlife Book Service, contributions, Teacher's and Leaders' Guides and general conservation matters; National Wildlife Federation 1412 16th Street, NW, Washington, D. C. 20036.

Membership, Change Of Address And Magazine Delivery letters should be sent to: National Wildlife Federation 1412 16th Street, NW, Washington, D. C. 20036. For change of address send old and new address and allow six weeks.

READERS' LETTERS

Address readers' letters to: Ranger Rick, Box 2299, Philadelphia, Pennsylvania 19103.

NATIONAL WILDLIFE FEDERATION

Officers: Dr. James H. Shaeffer, President; Walter L. Mims, G. Ray Arnett, Homer C. Luick, Vice Presidents; John Bain, Treasurer. Judge Lewis D. McGregor, President, NWF Endowment, Inc.

Directors: Dr. Donald J. Zinn, Robert W. Patterson, F. Bartow Culp, Herbert L. Alley, Dr. Frederick R. Scroggin, O. Dwight Gallimore, Paul H. Wendler, Henry J. LeBlanc, Sr., Everett R. Brue, N. A. Winter, Jr., A. W. Boddy, C. Clifton Young, Ernest E. Day, Courtney Burton, Joseph D. Hughes, Dr. Claude Moore, Robert Stack, Stewart L. Udall, M. A. Wright.

Staff: Louis S. Clapper, T. J. Hardgrove, Roger L. Henebry, William L. Reavley, F. H. Farrar, H. R. Morgan, Claude D. Kelley, Wendell Bever, Philip W. Schneider, Ed Chaney, Thomas L. Smith, E. Warner Shedd, Jr., James B. Ruch.

October, 1970 Volume 4 — Number 8

4 CAVES PART 2: ANIMALS THAT COME AND GO
10 RANGER RICK ANNUAL CONTEST
13 HOLLOW OAK BOOK NOOK
14 WHO-O-O KNOWS?
14 OLLIE OTTER'S FUN PAGE
16 BOOMER, THE MOUNTAIN BEAVER
18 RANGER RICK AND HIS FRIENDS
22 TRICK OR TREAT?
26 WATER — WHAT WOULD WE DO WITHOUT IT?
34 DEAR RANGER RICK
36 HALLOWEEN DOT PUZZLE
37 POEM: WHY RUN?
38 NATURE CLUB NEWS
39 WHEN THE FOOD RUNS OUT
44 A WARNING AT SEA

Cover Credits: Front — Screech Owl in cave by Charles E. Mohr; Back — Hide and seek in autumn leaves by Grant M. Haist.

RANGER RICK'S PLEDGE

I give my pledge as a member of Ranger Rick's Nature Club

To use my eyes to see the beauty of all outdoors.

To train my mind to learn the importance of nature.

To use my hands to help protect our soil, water, woods and wildlife.

And, by my good example, to show others how to respect, properly use and enjoy our natural resources.

YOUR NAME

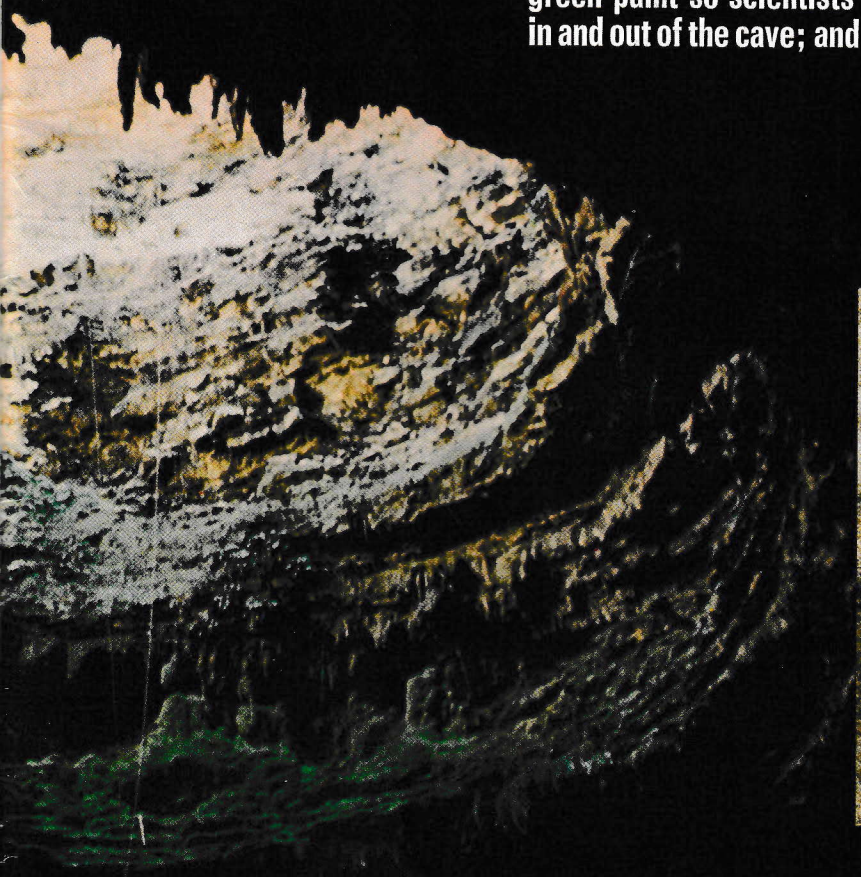
Member of EDPRESS

CAVES PART 2:

Animals That Come

and Go

Seeking coolness or warmth, darkness and safety, many creatures spend only part of their lives inside caves. A few of them are shown here, from left to right: a colorful salamander; hatching snails; a cave cricket sprayed with green paint so scientists can study its travels in and out of the cave; and cliff frogs. *Please turn the page*



by Charles E. Mohr

Long before air conditioning, farmers who were lucky enough to have a springhouse (a cellar with an underground stream running through it) could keep milk, butter and other foods fresh for a long time. Inside the springhouse it stayed cool in summer, yet above freezing in winter. Some springhouses are still in use.

Many farmers have noticed that during the winter, frogs and salamanders are seen in the spring water. Crickets, spiders, moths, snails, and even an occasional bat may cling to the inside roof or walls of the springhouse. There they were safe from the freezing weather only a few yards away outside.

On hot summer days, the farmer might find some salamanders, insects and spiders in the springhouse. By staying there during the day, these animals escape the heat and dryness outside. After dark, when it is cooler and damper, they may leave to search for food.

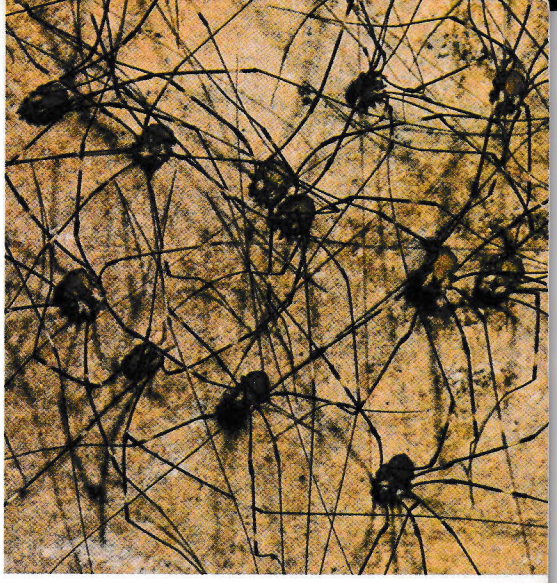
A cave is much like a springhouse. Its temperature stays almost the same during winter and summer. Therefore many animals find refuge in caves. The bigger the opening and the deeper the cave, the more animals find shelter there.

The public usually enters a "show" cave by way of an elevator or a stairway blasted through the rock. But most caves have natural openings.

Pages 4/5: Photos by Charles E. Mohr (salamander, cricket); Robert W. Mitchell (snail, frogs); Miles Tandy (cave). Pages 6/7 Photos by Robert W. Mitchell; Alvin E. Staffan (center)

Smallest American bat, the pipistrel, usually hibernates alone.

Indiana bats prefer company, and crowd together to hibernate.



Spider-like harvestmen also escape winter's cold in caves.

Crickets, cave spiders and big-eyed salamanders often gather around such passageways. This is how pack rats, bats, owls, raccoons and other animals may come and go. For them the caves are cool, moist and dark enough for resting, sleeping or hibernating.

There is a small cave in Mammoth Cave National Park in Kentucky that shelters cave crickets. Scientists marked thousands of these crickets with paint, a different color for each section of the cave. Whenever the weather was favorable at night about one-third of the insects left the cave to find food. They always returned to the same part of the cave where they had been.

In Pennsylvania, I often visited a cave where more than 300 long-tailed salamanders spent the winter. But in spring they marched out of the cave. Only in August,

Please turn the page

▲ South American birds of darkness, the oilbirds, are one of only two species of birds who nest in caves. ▼ Coatimundi, South American cousin of the raccoon, sometimes sleeps in caves.

when the countryside started drying up, did they return to the cool, moist cave.

In some regions bats fly hundreds of miles to spend the winter underground. If they stayed aboveground they would freeze or starve. Thousands of the Indiana or social bats, *Myotis sodalis,* come from all over the Midwest to gather each winter in caves in Kentucky and Missouri.

In Bat Cave in Kentucky's Carter Caves State Park, more than 100,000 of these bats hibernate. A stream flows through the cave and if a flash flood should occur, they would be in danger. Actually they have suffered more from attacks by people who do not understand their true nature and value. Through the years thousands of these bats have been killed. Now the State Conservation Department protects the cave and its wildlife.

In colder regions, bats leave the caves in spring when flying insects reappear. Where do they go? Probably they scatter far and wide. In an effort to chart the travels of bats, scientists have banded thousands of the animals when they were hibernating. Only a few of the Kentucky bats have been found: some of them in barns in Michigan, several hundred miles north.

Farther south, it is different. Bats stay in many southern caves in summer. At Carlsbad Caverns National Park in New Mexico, visitors gather outside the huge entrance pit to watch half a million bats come out when the sun sets. During the day the bats roost in a huge room a half-mile away from the tourists' part of the cave.

Naturalists have noticed that at Carlsbad the bats leave the cave before winter. Where do they go? Recovery of banded bats proved long flights were made into Mexico. The record was 810 miles!

When many bats fly out of a cave at dusk they are often attacked by hawks. The hawks dive repeatedly into the column of zigzagging bats. But seldom is a hawk able to snatch one because bats have natural "radar" systems.

Sometimes great horned owls and barn owls roost near the entrances of caves and try to catch bats as they fly out. Several times I've seen screech owls sitting so quietly on a ledge that they could easily be mistaken for stalagmites!

None of these animals spends its whole life in the cave. Where there are no caves, the same kinds of animals hide in cellarways, under logs, in deep rock crevices or other dark, damp places. It is just that in caves we are likely to find greater numbers of these animals out in full view, not hidden out of sight. Within the caves they are easier to see and study. Where else can you look at or touch one?

If we go deeper into the cave — beyond the "twilight zone"—we find animals that *never* leave the cave. They are born, they live and they die in absolute darkness. We'll look for them on our next cave adventure—in a future issue of *Ranger Rick.* *The End*

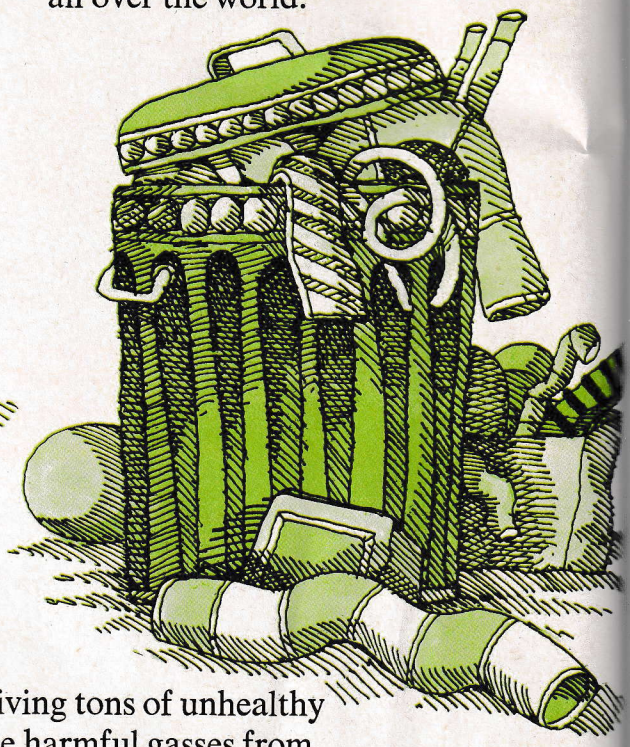
These skulls prove that armadillos often visit caves. Large dark one belongs to ancient armadillo; smaller one is modern.

Photos by Edward S. Ross; Walter Dawn; Charles E. Mohr

RANGER RICK'S FIFTH ANNUAL CONTEST

The World We Live In *that needs your help*

Garbage is piling up all over the world.

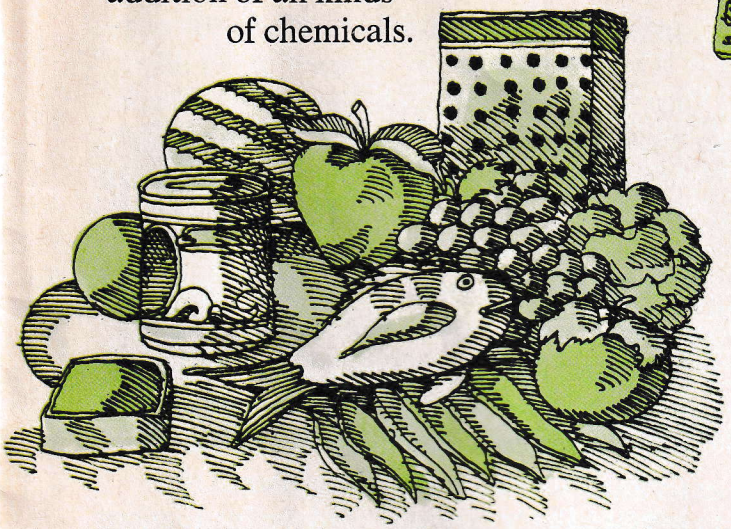


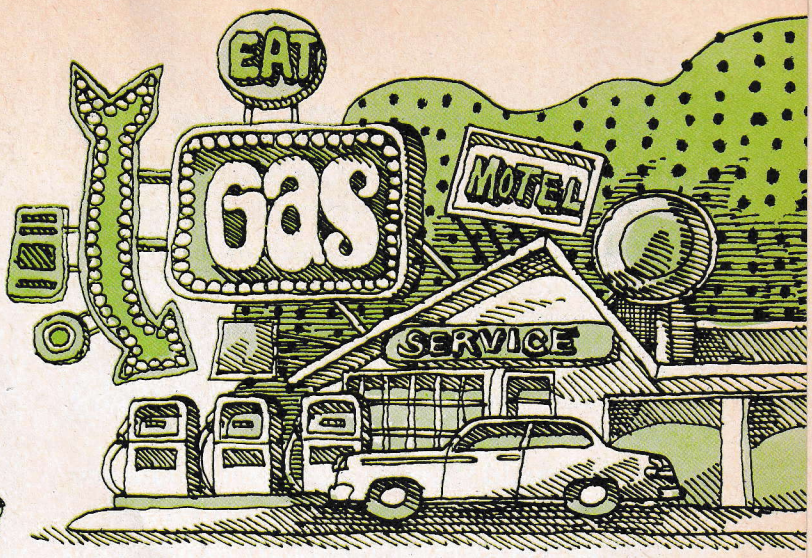
Waters are becoming polluted with sewage, fertilizers, radioactive wastes and other poisons.

Air is constantly receiving tons of unhealthy particles and invisible harmful gasses from cars, homes, factories and power plants.

Soils are being spoiled by pesticides and other destructive poisons. Forests are disappearing.

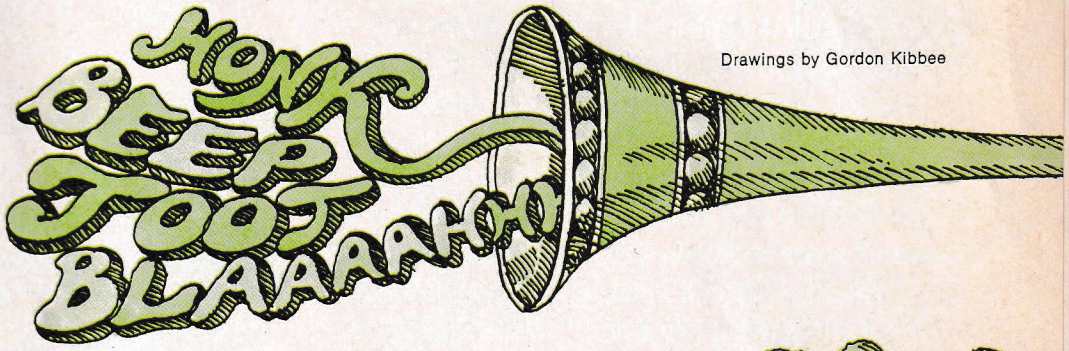
Food is contaminated with the addition of all kinds of chemicals.





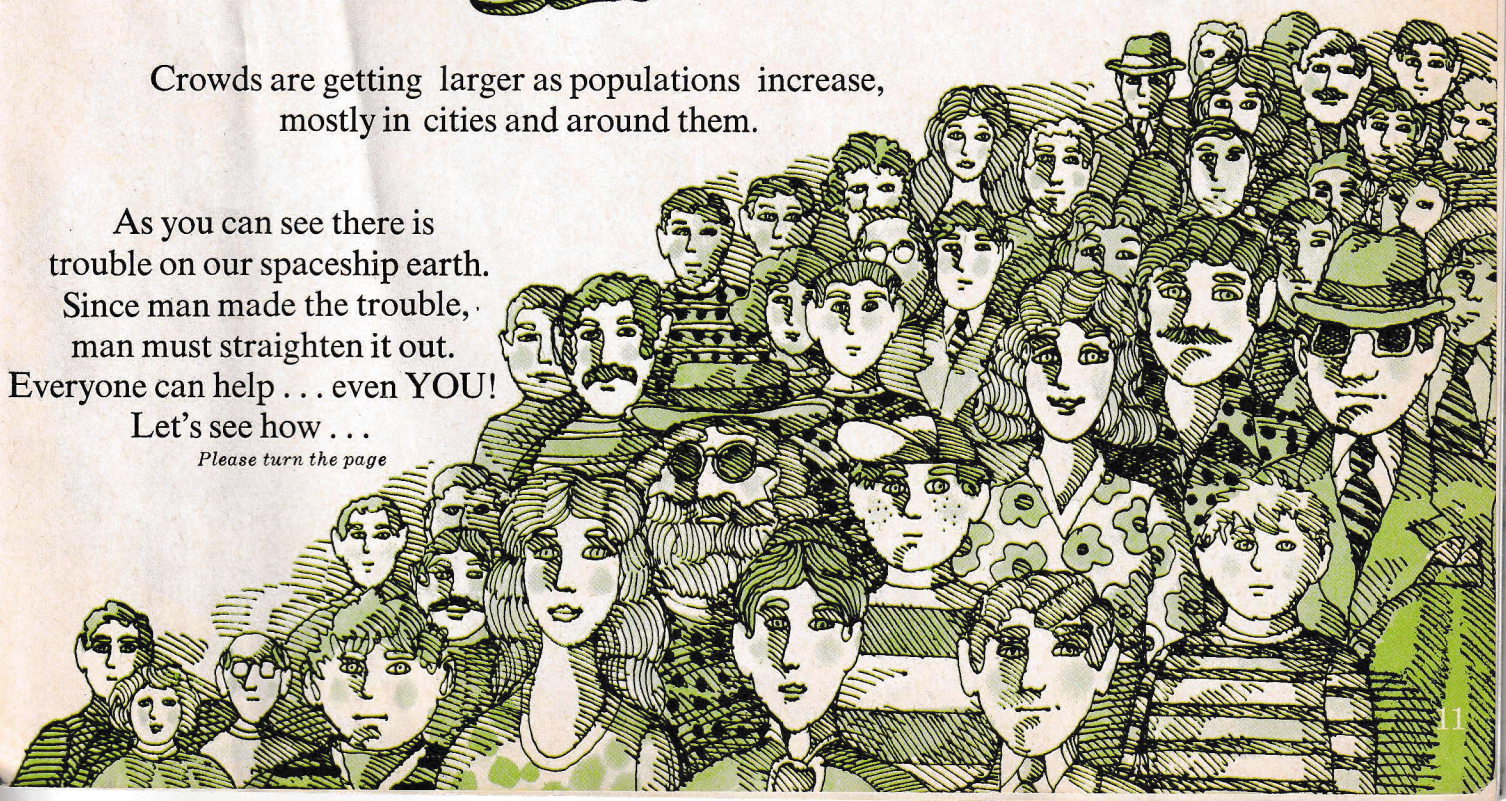
The landscape is beginning to look the same everywhere. It is ugly from the construction of roads, gas stations and other facilities.

Peace and silence is being destroyed by unhealthy noises from traffic and industry.



Drawings by Gordon Kibbee

Crowds are getting larger as populations increase, mostly in cities and around them.



As you can see there is trouble on our spaceship earth. Since man made the trouble, man must straighten it out. Everyone can help . . . even YOU! Let's see how . . .

Please turn the page

Get Ready...Get Set

You might consider your home, your neighborhood or your school as a unit of Spaceship Earth. What comes into it (manmade and natural) from the environment? What goes out and what happens to it then?

A list of one kind—like the various types of containers that go out in the trash in a week—could show up a problem. Could you do without some of the plastic bottles that clog filter screens in community incinerators? How can you convince the stores and manufacturers that the buying public can do without certain kinds of "disposable" containers, and even some of the products they contain?

Or consider this: everything we can save cuts down on pollution. Paper, water and electricity are far too important to be used one bit more than they are really needed. Can you think of good ways to discourage waste? Multiply that by the number of people you can get to cooperate—and you'll see that your efforts CAN make a difference.

Adopt a littered land or water area. Clean it up and arrange to keep it clean. Organize a drive to save an area which may be spoiled and is worth saving as green open space.

Collect evidence of local air and/or water pollution. Draw a map of the locations and get the names of the polluters. Find out whether the polluters know the damage they are doing and how they promise to correct it. If you get no results, get community groups to take legal action.

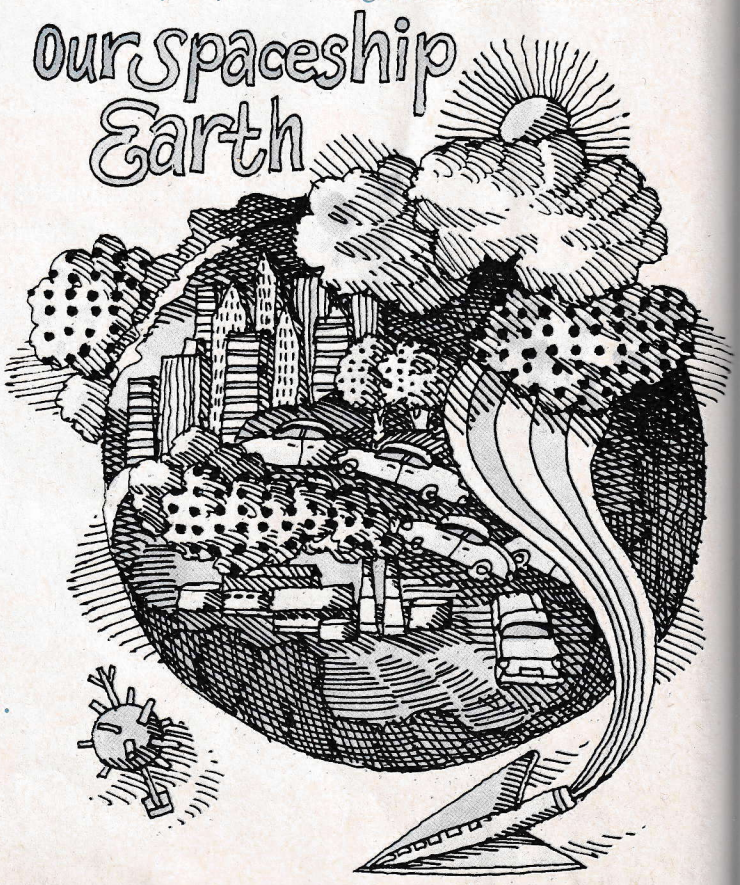
...and GO!

Start in a small way and get the facts. As you think them through, good ideas for action will develop. Tell everybody you can about these ideas until all the people who can help you are involved. Ask for *their* ideas.

You may enter as an individual, a club or a school class. Your parents and friends, teachers and leaders will have many more ideas than the ones suggested here. The article on water in this issue (Page 26) and "The Mess We're In" (Page 4 in the July issue) offer useful leads. A guide that deals with every kind of problem, large and small, and suggests action that you can take is THE ENVIRONMENTAL HANDBOOK (Ballantine Books, Inc.)—95 cents, paperback.

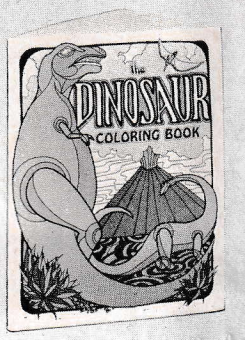
Whatever the problem is you wish to correct, keep this in mind: that good housekeeping on Spaceship Earth is not only a matter of cutting down on dirt and ugliness, it just *could* be a matter of life and death.

Now you can turn to the center of this issue and *very carefully* read the instructions for entering RANGER RICK'S FIFTH ANNUAL CONTEST. *Remember: No entry will be accepted without a Ranger Rick Nature Club Membership Number—the one on the special membership card you received when you joined Ranger Rick's Nature Club.*



GIANT REPTILES THAT RULED THE EARTH!

THE DINOSAUR COLORING BOOK



In the Mesozoic Era the dinosaurs began their reign. For one hundred thirty million years these giant reptiles dominated the earth — eating, fighting, reproducing and changing into many curious and spectacular forms — then they became extinct. From Dimetrodon to Triceratops, all the dinosaurs are described and illustrated with outline drawings in this great coloring book for children of all ages. 30 pages, 9¾″x 12½″.

63274GA-2 Non-members $2.00
63274GA MEMBERS' PRICE $1.60

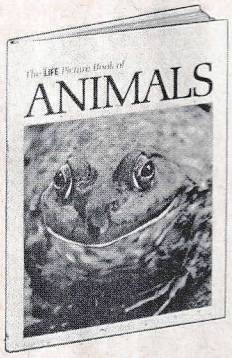
THE MOLE FAMILY'S CHRISTMAS

Russell Hoban
Pictures by Lillian Hoban

Laugh along with the Mole Family as they depart from the boring routine of tunnelling mole holes to look for some excitement. Young Delver Mole finds out about Christmas. He tells Mother and Father Mole all about it and eagerly waits for Jolly Santa to slide down the mole hole with a fat pack of presents. But the best laid plans of moles and men often go astray. Despite diligent digging by the whole Mole family, their "chimney" turns out to be just big enough for Santa's hand. A treat for readers 4-8. 48 pages, 7″x 9″.

63014GA-2 Non-members $3.50
63014GA MEMBERS' PRICE $2.80

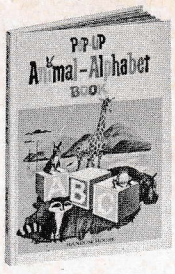
THE LIFE PICTURE BOOK OF ANIMALS



All your animal favorites are here in beautiful, lifelike color in this big book. The extra-large page size makes close-up views fascinating. You explore every curious feature, and admire every graceful line and winning expression of a wide assortment of members of the animal kingdom. In the back of the book are found informative descriptions of the creatures whose pictures fill the front. Recommended especially for younger children. 64 pages, 9¼″ x 12¼″.

63023GA-2 Non-members $3.95
63023GA MEMBERS' PRICE $3.15

POP-UP ANIMAL ALPHABET

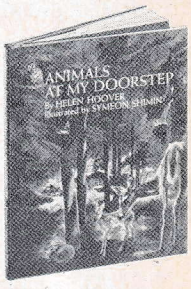


Here is pop-up reading fun, in three dimensions. An amusing, instructive way for children 4 and older to take the first important step in the process of education. Clever cut-outs pop into view and create three-dimensional scenes which never fail to intrigue the little reader. Recommended highly for both its entertainment value and the practical lessons which it teaches tiny tots. 22 pages, 6¾″x 9¼″.

62266GA-2 Non-members $1.95
62266GA MEMBERS' PRICE $1.60

ANIMALS AT MY DOORSTEP

Helen Hoover



A collection of fascinating wildlife anecdotes by the well-known author of *Long Shadowed Forest*. They are illustrated with color pictures and designed to please children 5 to 8. From the front door of her cabin deep in the Minnesota woods, Helen observes and reports on the quaint behavior of a large variety of shy woodland creatures. 60 pages, 7⅛″x 9⅛″.

62720GA-2 Non-members $3.50
62720GA MEMBERS' PRICE $2.80

Autumn Favorites

ANIMAL CHAMPIONS *by Ronald Rood* tells about the biggest, smallest and fastest animals in the world. 157 pages, 8¼″x 11¼″, ages 9 and up.

63201GA-2 Non-members $4.95
63201GA MEMBERS' PRICE $3.95

ARCTIC MAMMALS *by Helen Hoke* is the exciting story of animals which live in the land of snow and ice. 66 pages, 7¼″x 8¾″, 9 and up.

63210GA-2 Non-members $3.25
63210GA MEMBERS' PRICE $2.70

LEARNING ABOUT NATURE THROUGH GAMES. *Virginia W. Musselman* describes exciting activities for groups of all sizes. 128 pages, 5½″x 8¼″, all ages.

62668GA-2 Non-members $3.95
62668GA MEMBERS' PRICE $3.15

THE WORLD'S VANISHING ANIMALS: THE MAMMALS. *C. Littlewood and D. W. Ovenden* tell the story of our endangered species.

63229GA-2 Non-members $4.50
63229GA MEMBERS' PRICE $3.70

CHARLIE, THE LONESOME COUGAR is a hilarious adventure story based on the Walt Disney movie. 78 pages, 7⅛″x 8½″, ages 9 and up.

63238GA-2 Non-members $3.95
63238GA MEMBERS' PRICE $3.20

WILD BIRD WORLD. Text and illustrations by *C. B. Colby* will tell you all you want to know about birds. 88 pages, 7½″x 8¾″, ages 9 to 13.

63256GA-2 Non-members $3.95
63256GA MEMBERS' PRICE $3.20

MONKEYS AND APES *by Richard G. Van Gelder* is a colorful and delightful presentation of these amusing animals. 32 pages, 10½″x 8¼″, ages 6 to 9.

63265GA-2 Non-members $3.95
63265GA MEMBERS' PRICE $3.20

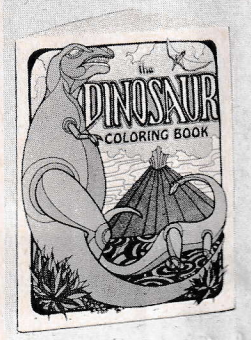
LEARNING ABOUT NATURE THROUGH CRAFTS *by Virginia W. Musselman* is full of ideas for gifts made with nature's own products. 128 pages, 5½″ x 8¼″, all ages.

62971GA-2 Non-members $3.95
62971GA MEMBERS' PRICE $3.15

USE ORDER FORM ON PAGE 12A

GIANT REPTILES THAT RULED THE EARTH!

THE DINOSAUR COLORING BOOK

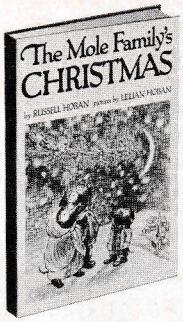


In the Mesozoic Era the dinosaurs began their reign. For one hundred thirty million years these giant reptiles dominated the earth — eating, fighting, reproducing and changing into many curious and spectacular forms — then they became extinct. From Dimetrodon to Triceratops, all the dinosaurs are described and illustrated with outline drawings in this great coloring book for children of all ages. 30 pages, 9¾"x 12½".

63274GA-2 Non-members $2.00
63274GA MEMBERS' PRICE $1.60

THE MOLE FAMILY'S CHRISTMAS

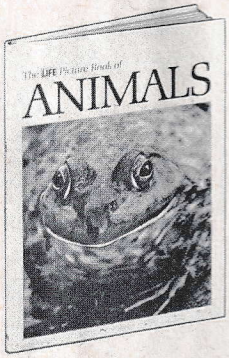
Russell Hoban
Pictures by Lillian Hoban



Laugh along with the Mole Family as they depart from the boring routine of tunnelling mole holes to look for some excitement. Young Delver Mole finds out about Christmas. He tells Mother and Father Mole all about it and eagerly waits for Jolly Santa to slide down the mole hole with a fat pack of presents. But the best laid plans of moles and men often go astray. Despite diligent digging by the whole Mole family, their "chimney" turns out to be just big enough for Santa's hand. A treat for readers 4-8. 48 pages, 7"x 9".

63014GA-2 Non-members $3.50
63014GA MEMBERS' PRICE $2.80

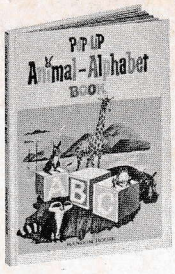
THE LIFE PICTURE BOOK OF ANIMALS



All your animal favorites are here in beautiful, lifelike color in this big book. The extra-large page size makes close-up views fascinating. You explore every curious feature, and admire every graceful line and winning expression of a wide assortment of members of the animal kingdom. In the back of the book are found informative descriptions of the creatures whose pictures fill the front. Recommended especially for younger children. 64 pages, 9¼" x 12¼".

63023GA-2 Non-members $3.95
63023GA MEMBERS' PRICE $3.15

POP-UP ANIMAL ALPHABET

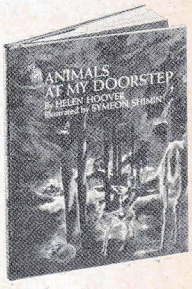


Here is pop-up reading fun, in three dimensions. An amusing, instructive way for children 4 and older to take the first important step in the process of education. Clever cut-outs pop into view and create three-dimensional scenes which never fail to intrigue the little reader. Recommended highly for both its entertainment value and the practical lessons which it teaches tiny tots. 22 pages, 6¾"x 9¼".

62266GA-2 Non-members $1.95
62266GA MEMBERS' PRICE $1.60

ANIMALS AT MY DOORSTEP

Helen Hoover



A collection of fascinating wildlife anecdotes by the well-known author of *Long Shadowed Forest*. They are illustrated with color pictures and designed to please children 5 to 8. From the front door of her cabin deep in the Minnesota woods, Helen observes and reports on the quaint behavior of a large variety of shy woodland creatures. 60 pages, 7⅛"x 9⅛".

62720GA-2 Non-members $3.50
62720GA MEMBERS' PRICE $2.80

Autumn Favorites

ANIMAL CHAMPIONS *by Ronald Rood* tells about the biggest, smallest and fastest animals in the world. 157 pages, 8¼"x 11¼", ages 9 and up.

63201GA-2 Non-members $4.95
63201GA MEMBERS' PRICE $3.95

CHARLIE, THE LONESOME COUGAR is a hilarious adventure story based on the Walt Disney movie. 78 pages, 7⅛"x 8½", ages 9 and up.

63238GA-2 Non-members $3.95
63238GA MEMBERS' PRICE $3.20

ARCTIC MAMMALS *by Helen Hoke* is the exciting story of animals which live in the land of snow and ice. 66 pages, 7¼"x 8¾", 9 and up.

63210GA-2 Non-members $3.25
63210GA MEMBERS' PRICE $2.70

WILD BIRD WORLD. Text and illustrations by *C. B. Colby* will tell you all you want to know about birds. 88 pages, 7½"x 8¾", ages 9 to 13.

63256GA-2 Non-members $3.95
63256GA MEMBERS' PRICE $3.20

LEARNING ABOUT NATURE THROUGH GAMES. *Virginia W. Musselman* describes exciting activities for groups of all sizes. 128 pages, 5½"x 8¼", all ages.

62668GA-2 Non-members $3.95
62668GA MEMBERS' PRICE $3.15

MONKEYS AND APES *by Richard G. Van Gelder* is a colorful and delightful presentation of these amusing animals. 32 pages, 10½"x 8¼", ages 6 to 9.

63265GA-2 Non-members $3.95
63265GA MEMBERS' PRICE $3.20

THE WORLD'S VANISHING ANIMALS: THE MAMMALS. *C. Littlewood and D. W. Ovenden* tell the story of our endangered species.

63229GA-2 Non-members $4.50
63229GA MEMBERS' PRICE $3.70

LEARNING ABOUT NATURE THROUGH CRAFTS *by Virginia W. Musselman* is full of ideas for gifts made with nature's own products. 128 pages, 5½" x 8¼", all ages.

62971GA-2 Non-members $3.95
62971GA MEMBERS' PRICE $3.15

USE ORDER FORM ON PAGE 12A

BOOMER
The Mountain Beaver

by Fred Johnson

When is a beaver not a beaver? When he's an aplodontia (app-lo-DON-chee-ah). Not many people have even heard of this animal, for few are able to live in captivity.

Often called the mountain beaver, or sewellel, **Aplodontia rufa** is the only known survivor of the oldest family of living rodents. The ordinary beaver is a rodent, too, but belongs to a different family. In the Pacific northwestern states where the mountain beaver lives, he is usually called "Boomer." He got his name from old-time loggers.

Boomer has reddish-brown fur, grows up to 18 inches long and weighs up to 3 pounds. He seldom appears in the daytime unless it is cloudy, probably because he has weak eyes. He has long, sensitive whiskers and a very good sense of smell that helps him get around at nighttime.

Although he is shy and usually avoids trouble, he will put up a good fight when cornered. His front teeth are large, chisel-like and sharp.

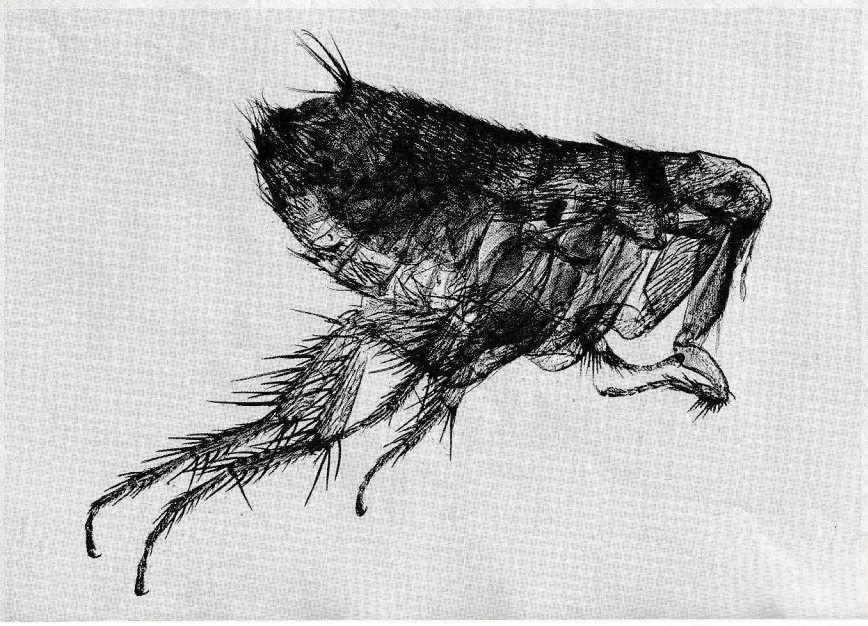
Let's go on a Boomer hunt. We'll walk along a cool, damp hillside above a stream. But we won't look for a dam, because Boomer doesn't live in the water, though he is a good swimmer. He tunnels into hillsides near streams. He doesn't have a big, flat tail either. He has a little one-inch nubbin.

On our hunt for Boomer, the first clue could be a clump of wood ferns. Look for fronds that have been cleanly cut off about 3 inches above the ground. Aha! There are some cut fronds neatly stacked, along with other plants, beside a hole in the ground. We've found Boomer's front door—or more likely, just one of his doors. He usually has several, and he keeps a good supply of food beside each door, with plenty more of it in the tunnel.

If we could crawl through one of these doors we would be in a tunnel about 6 to 8 inches in diameter. Off the main tunnel are side tunnels, some leading to storerooms, some up to other doors, some back to the main tunnel. One leads to a bedroom the size of a large bucket.

Boomer seems to enjoy tunneling. Like the true beaver, he is always improving his home, adding here, changing there. His legs are short and powerful, with long, strong claws on the front feet. Using his broad, blunt head, heavy shoulders and chest as a ram, he forces his way through the soft earth by pushing with his back legs. Every so often he pushes to the surface and shoves some soil out, making another door. His tunnel twists and turns to avoid rocks and thick roots.

Largest flea in the world (3/8″) makes its home on poor Boomer.



If he finds the tender roots of a bush or small tree, he simply eats them. This kills the part which grows aboveground. Sometimes after he eats the roots, he tunnels to the surface and pulls the rest of the bush or tree into the hole. This plugs the hole, but lets air through.

Boomer does much damage at times — especially where men have planted rows of young trees. (This is called a "reforestation project") He has been known to work his way along under a line of newly planted trees, chomping and munching roots

Photos by Victor B. Scheffer

all the way. He can be a problem to farmers and gardeners too.

During the winter rains his tunnel sometimes gets flooded. This doesn't seem to upset him. He just splashes back and forth, rearranging his food supply. If the tunnel fills up, he swims out and looks for a drier place to start a new one. After a heavy snow he may come up and start a set of new tunnels through it.

Boomer prefers to live in a one-family tunnel. He and Mrs. Boomer (it's hard to tell which is which) breed in February or March. About one month later two to five young are born. They won't be able to care for themselves until they are three or four months old.

Boomer has another claim to fame. He is pestered by the largest fleas in the world. The fleas sometimes measure three eighths of an inch in length!

How did he get the name "mountain beaver"? Long ago men saw his long, chisel-like front teeth that can bite off a branch three quarters of an inch thick, so they thought he must be a member of the beaver family. But he really isn't!

How did he get the name "sewellel"? When the Lewis and Clark expedition reached our Northwest about 1805, the Indians gave them robes made of mountain beaver skins. The explorers asked what the fur was, and the Indians said "Sewellel." The Indians thought that the explorers had asked what the robes were, so they told them the Indian word for robe — sewellel.

Poor Boomer. He was mixed up even then! The End

Ranger Rick And His Friends

Adventure 38 The Bounty Hunters

by J. A. Brownridge

A bright, full moon shone in the sky as Ranger Rick, Ollie Otter and Oscar Rabbit trotted across a western prairie. A soft breeze rustled the leaves in a cottonwood grove nearby and water in a stream tumbled over some rocks as it hurried down a hillside. These were the only sounds that reached the ears of the three traveling friends.

"Gosh, it sure is quiet," whispered Ollie.

"Why are you whispering?" chuckled Rick. "Do you think somebody is about to pounce on you?"

"I don't know," replied Ollie. "It just feels weird way out here. Look at all those stars. I've never seen so many of them in my life. The moon looks so much bigger and brighter out here too."

"It's just because you're so far from any town or any lights," explained Rick. "Back home, the reflection of the lights from Big Town hides a lot of stars. Smoke and smog keep the moon from shining so clearly too."

"Just the same, I feel nervous," Ollie said with a little shiver in his voice.

At that very moment, a piercing howl shattered the silence.

"Yi!" screamed Ollie as he leaped straight up in the air. He was completely terrified and didn't know which way to run.

"Calm down," Rick commanded sternly. "Be quiet for a minute until we see where that noise came from."

"I've never heard anything so scary in my life," chattered Ollie.

"It was pretty bad," agreed Oscar Rabbit, who had flattened himself on the ground as soon as he heard the noise. "I sure wish my cousin Jack were here. He'd know what made that noise."

"We should be very close to Jack's home by now," said Rick. "We've come a long way to visit him. I hope he's expecting us."

"I sure am," came an amused voice from behind a clump of bushes.

"Oh, no," gasped Ollie, who was startled again by an unexpected voice so close by.

"It's all right, Ollie," said Oscar. "It's only my cousin, Jack Rabbit."

"That's right," came a reassuring voice as a very large rabbit hopped out into the moonlight. "Welcome to our part of the country. We're very happy that you came to visit us."

"Never mind that," said Ollie very impolitely. "What was that awful sound we heard just before you came along?"

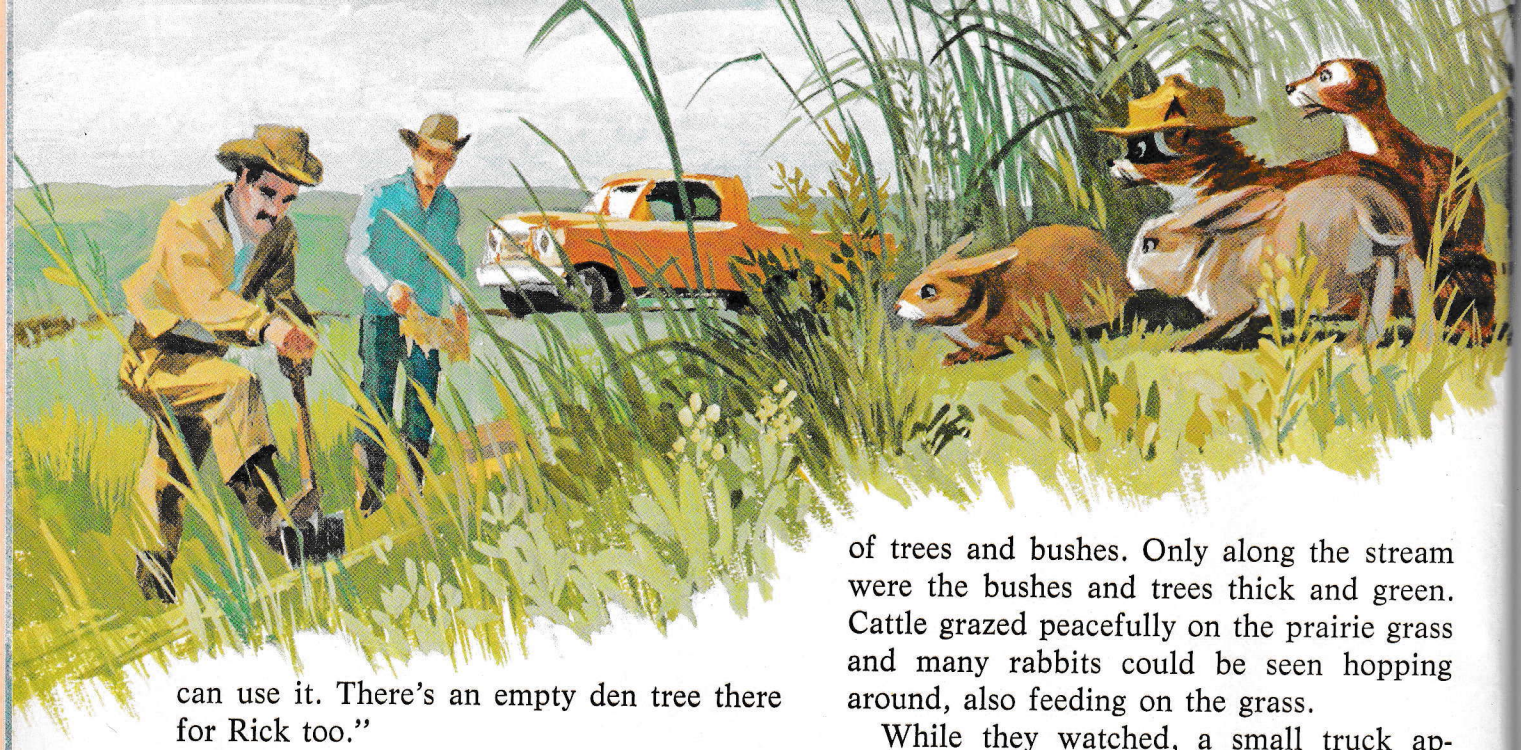
"Oh, that," laughed Jack. "That was old Clifford Coyote howling at the moon. Peek around these bushes and look at the top of the hill. You can see Clifford sitting there."

Sure enough, when they looked where Jack told them, they could see what looked like a medium-sized dog sitting on the top of a big rock, silhouetted against the moon. As they watched, he threw back his head and the same piercing howl shattered the silence of the prairie.

"Boy! That's scary even when you know what it is," chattered Ollie. "Have you a home or burrow around here someplace where we can spend the rest of the night?"

"I'm sorry, fellows," Jack replied. "We jackrabbits don't dig burrows. I do know of a few empty ones where I hide in an emergency. There is one over by the trees. You

Please turn the page



can use it. There's an empty den tree there for Rick too."

"Where *do* you sleep?" asked Rick.

"We sleep in clumps of bushes," Jack answered, "or almost anywhere. Here's where you can sleep. I'll see you tomorrow and show you around."

The travelers were tired from their journey and were soon sound asleep. Only Ollie squirmed nervously with each coyote howl.

Early the next morning, Jack returned to round up his visitors.

"Good morning," he called cheerfully. "It's time to get started if you're going to see what this country is like. Let's go up the hill where Clifford was last night. We can get a good view from there."

"Are you sure Clifford has gone?" asked Ollie. "What does he eat, anyway?"

"Oh, I'm sure he's gone," replied Jack. "I checked that out earlier. We do have to be careful, though, because his diet is mostly rabbits and rodents. They are always plentiful. Sometimes he will even eat grasshoppers and other large insects. But if he gets a chance, he'll kill a young sheep or goat."

When they reached the top of the hill, they could see for miles in every direction. The land was very flat with only a few clumps of trees and bushes. Only along the stream were the bushes and trees thick and green. Cattle grazed peacefully on the prairie grass and many rabbits could be seen hopping around, also feeding on the grass.

While they watched, a small truck appeared and drove close to the hill where the four animals were watching. Two men got out and took what looked like a rabbit fur from the back of the truck. Attached to it was a small metal cartridge. They dug a small hole, placed the cartridge in the hole, and covered it with dirt, leaving only the fur showing. They sprayed the fur, brushed away their tracks, then got back into the truck and drove away. They repeated the action several times before they disappeared.

"Let's go down and see what they did," said Ollie curiously.

"No, indeed!" replied Jack sternly. "Those men are bounty hunters."

"They didn't seem to be hunting," spoke up Oscar. "They weren't paying any attention to the animals around them, and there were no guns to be seen. Besides, who ever heard of hunters burying something in the ground and leaving a fur like that behind?"

"They're hunters all right," Jack answered. "But they don't hunt with guns. They have taken rabbit fur, sprayed it with a special scent that attracts coyotes and attached it to a cyanide gun. Cyanide is a deadly poison. They're after Clifford Coyote

and his friends. The state government pays a *bounty* (a certain amount of money) for each coyote skin that's turned in. That's why the men are called bounty hunters."

"I never heard of that where we come from," said the surprised Ollie.

"That's right," spoke up Rick. "Most states now know that bounties are bunk and just lead to senseless killing of valuable predators. Only a few states still have bounty systems, and I hope our Rangers and their families will work to get rid of them."

As they watched, Clifford Coyote came trotting out of the trees by the stream. He stopped to sniff the air and then cautiously crept toward the bait.

"Oh, no," gasped Ollie. "Can't we warn him?"

"I'm afraid not," answered Jack. "We'd better be careful ourselves because some of his family are probably close by. They usually hunt in groups. In fact, I think that's why these bounty hunters are here. Sometimes predators become a real menace. I know Clifford and his friends went wild last week and killed a lot of sheep and just left them on the prairie."

While Jack was still speaking, the unsuspecting coyote reached the bait. He circled it several times, as if he were puzzled by the good fortune that brought him his easy meal.

Seeing nothing suspicious, Clifford became braver and moved in to take a big bite. As soon as he touched the fur with his teeth, the hidden cyanide gun shot the deadly poison into the startled animal's mouth. He thrashed about in agony, ran about 100 feet, and suddenly it was over. Another coyote lay dead waiting to be picked up by the bounty hunters.

"That sure wasn't pleasant to watch," said Ollie, shuddering.

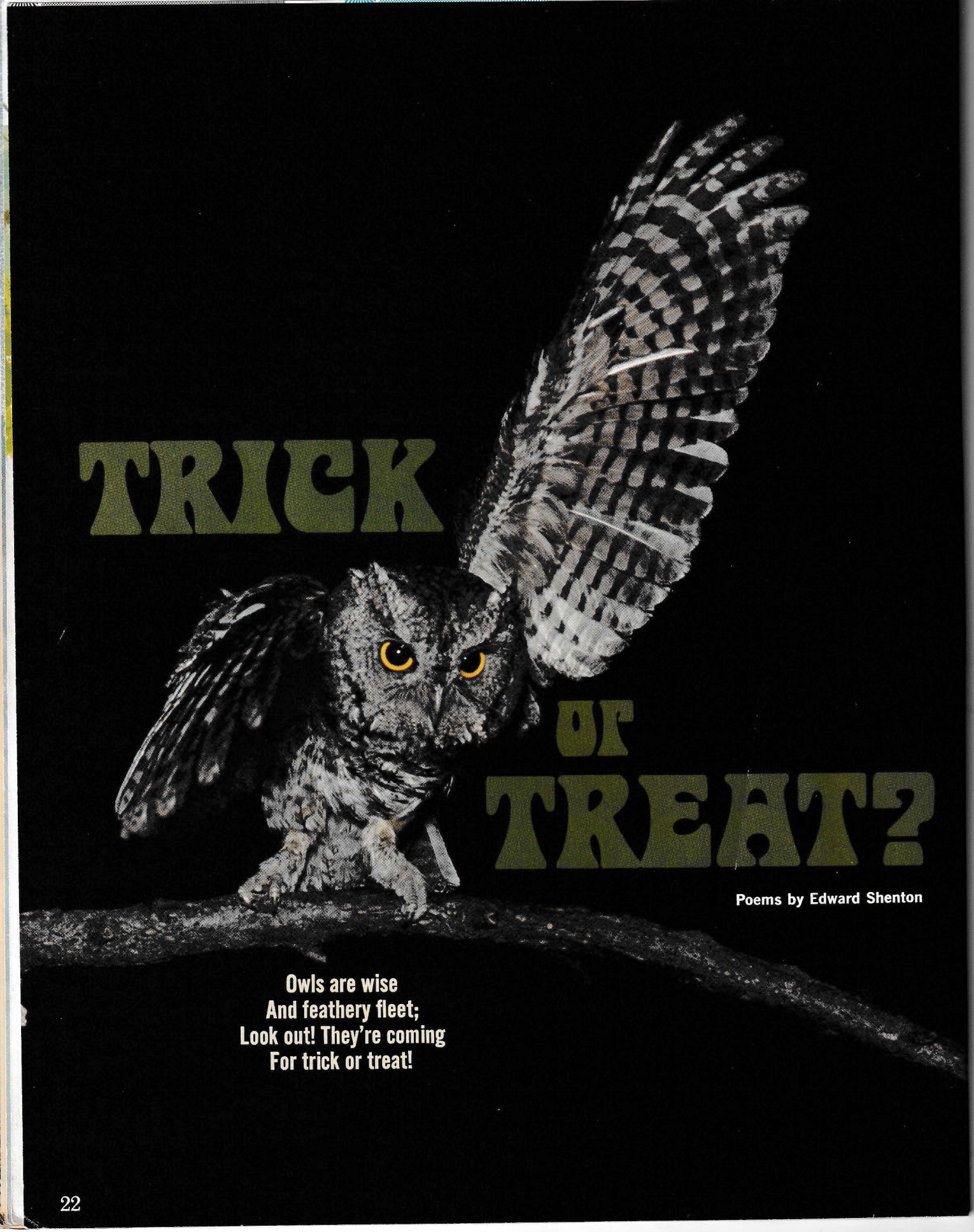
"No, it wasn't," replied Rick. "Most of the time predators do a lot of good and shouldn't be hunted down recklessly just for the bounty. But when they start killing farmers' chickens or other animals then they must be controlled.

"Now, let's get away from here and see something more pleasant."

With that, the four friends trotted down the hill in search of happier adventures.

The End

Drawings by Lorin Thompson



TRICK OR TREAT?

Poems by Edward Shenton

Owls are wise
And feathery fleet;
Look out! They're coming
For trick or treat!

The screech owl
Does not screech at all,
His shivery, quivery,
Silvery call
Is heard at dusk,
Now far, now near,
Now soft, now clear;
To wit! To wit!
Ta whoo! Ta whoo!
I'm a screech owl,
Who are you?

Photos by Tom Myers
and L. L. Rue (left)

On All Hallow's Eve
The young barn owl
Stands and stares
With a scary scowl.
Winking one eye,
Watching with the other,
Seeking to spy
The mice worrying,
The crickets scurrying,
The rabbits hurrying—
Waiting to snatch them.
What a trick
To catch them.
What a treat
To eat them.

The burrowing owl,
Soft and round,
Digs his dwelling
Underground.
Unconcerned, his
Home he makes
With prairie dogs
And rattlesnakes.
Alas! I'm sorry
To reveal
His neighbors often
Are his meal.
Unlike all owls,
He sleeps at night;
By day, beside
His door, upright,
He stands and bows,
If you go by;
He's so polite,
I wonder why?

by Gerald Schneider

WATER AND LIFE. You and everyone else and all other animals and all plants are mostly water. Life as you know it would be impossible if you did not have water to drink. You require at least 5 pints a day. A horse needs about 15 gallons a day. How much water does your pet dog, cat or bird drink?

Your own body is 65 percent water. Discover for yourself something about the amount of water in plants and animals. Cut some thin slices of potato, cucumber or some other fresh vegetable. Weigh the slices on a small scale and record the weight. Then put

Drawings by
John Huehnergarth

the slices near a sunny window to dry. Reweigh them when they are dry. The difference between the first and second weights is the amount of water lost. Can you figure out what percentage of the vegetable was water? Do the same with a dead worm.

WATER IN YOUR HOME. Besides keeping you alive, water has important uses in your home. It cleans your body as well as dishes, clothes, floors and cars. Air conditioners remove water vapor from the air to cool houses. Sprinklers spray it on lawns to keep them green. Wastes are flushed with water through pipes and sewers. All in all you probably use about 70 gallons of water a day at your house. How many gallons do you use in a month, a year? How would you like to carry that much water from a well?

WATER AT WORK. As many as 65,000 gallons of water are used to make one ton of steel, and almost that many to make a ton of paper. Oil refineries use about 6 gallons of water for every gallon of gasoline they produce. Hydroelectric dams use water to turn the turbines that make electricity for millions of people. *Please turn the page*

Oceans and rivers are watery routes for ships carrying people and goods around the world. Oceans, lakes, ponds, swamps, marshes, rivers and streams are homes for wildlife. They are also places where people may enjoy swimming, fishing, boating and many other kinds of outdoor recreation.

Water helps to shape the landscape by washing away (eroding) rock and soil. Such erosion can create a magnificent place like the Grand Canyon or wash away valuable topsoil from farms. Piped to dry places, water permits crops to grow. This is called irrigation. Too much water—a flood—can destroy buildings, bridges and highways. Too little water—a drought—can destroy people, wildlife, and crops.

WATER POLLUTION. Water is *polluted* when it is unsafe to use, largely because of sewage and wastes dumped into it. Polluted water may smell, have garbage floating in it, be choked with trash and be unsafe for swimming or boating. Most large waterways in the U.S.A. show signs of pollution. Are lakes, streams or seashores near you polluted?

Photos courtesy of Milwaukee Journal by George P. Koshollek

Some years ago makers of detergents developed laundry aids that would work well even in hard water. This seemed like a great idea to housewives. But—slowly at first and then faster—rivers and streams and lakes piled up with suds. The detergent makers had not realized that the chemicals they added to the laundry products could not be broken down by bacterial action as regular soaps can. They had to find different chemicals that could be more easily broken down.

Now the mountains of suds are rapidly disappearing, but other chemicals called *phosphates* are still present in detergents. Phosphates are great plant food. They cause the tiny green algae that grow in water to multiply and clog our waterways. Soon the green mats of water plants turn dark and smell as they die. Bacteria in the water can break down a certain amount of dead algae, but they cannot handle these huge amounts.

That is only part of the problem. There are phosphates found in wastes from industry, and phosphates are an important part of the chemical fertilizers that help farmers grow better crops. When more fertilizer is used

Please turn the page

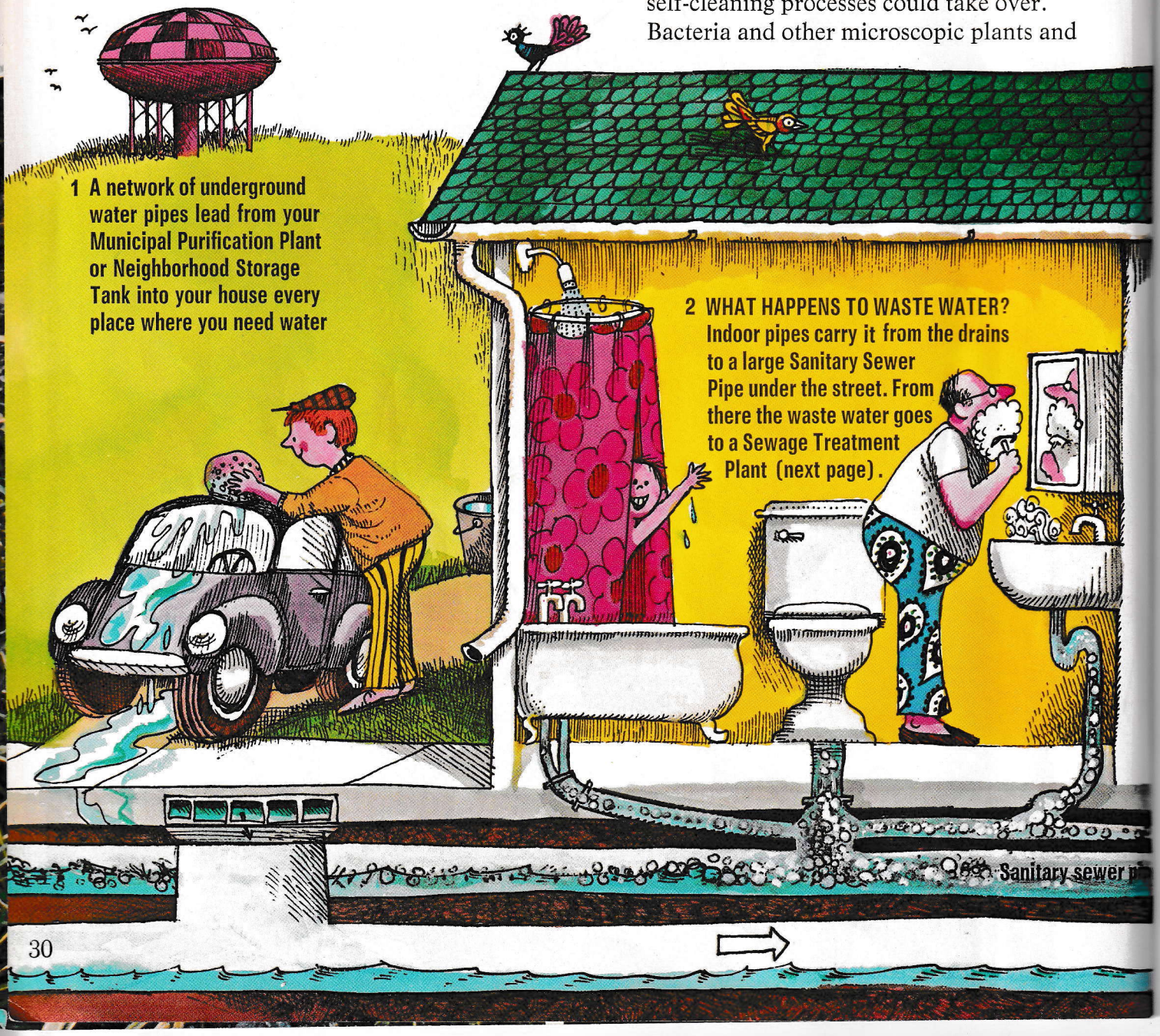
1. Open ditch rots with sewage and stinks from algae. 2. Detergent foam collects along the shore of the Pewaukee River. 3. Net dipped into Wisconsin River near pulp mill is covered with sludge. 4. Green frog in polluted pond.

Photo by Larry West

than the plants can take in, large amounts wash off the soil into our waterways. This is another example of something that seems good (making the soil produce more food) but has bad side effects that no one foresaw.

WATER TREATMENT BEFORE USING. What happens to the water that is piped into your home depends on where your town gets it. If it is pumped from a deep underground well it is probably pure enough to be pumped to neighborhood storage tanks and from there to homes, stores and factories. If the water comes from a lake or river it must be treated at a municipal purification plant. Why not visit the one in your community?

WATER TREATMENT AFTER USING. Once upon a time, when there were fewer users of water, the wastes went from buildings to a network of sewer pipes under the streets and into a big pipe that emptied them back into the waterways. There was enough clean water there to dilute the wastes. Then nature's self-cleaning processes could take over. Bacteria and other microscopic plants and


1 A network of underground water pipes lead from your Municipal Purification Plant or Neighborhood Storage Tank into your house every place where you need water
2 WHAT HAPPENS TO WASTE WATER? Indoor pipes carry it from the drains to a large Sanitary Sewer Pipe under the street. From there the waste water goes to a Sewage Treatment Plant (next page).
Sanitary sewer p

animals in the water could break down the wastes into harmless substances.

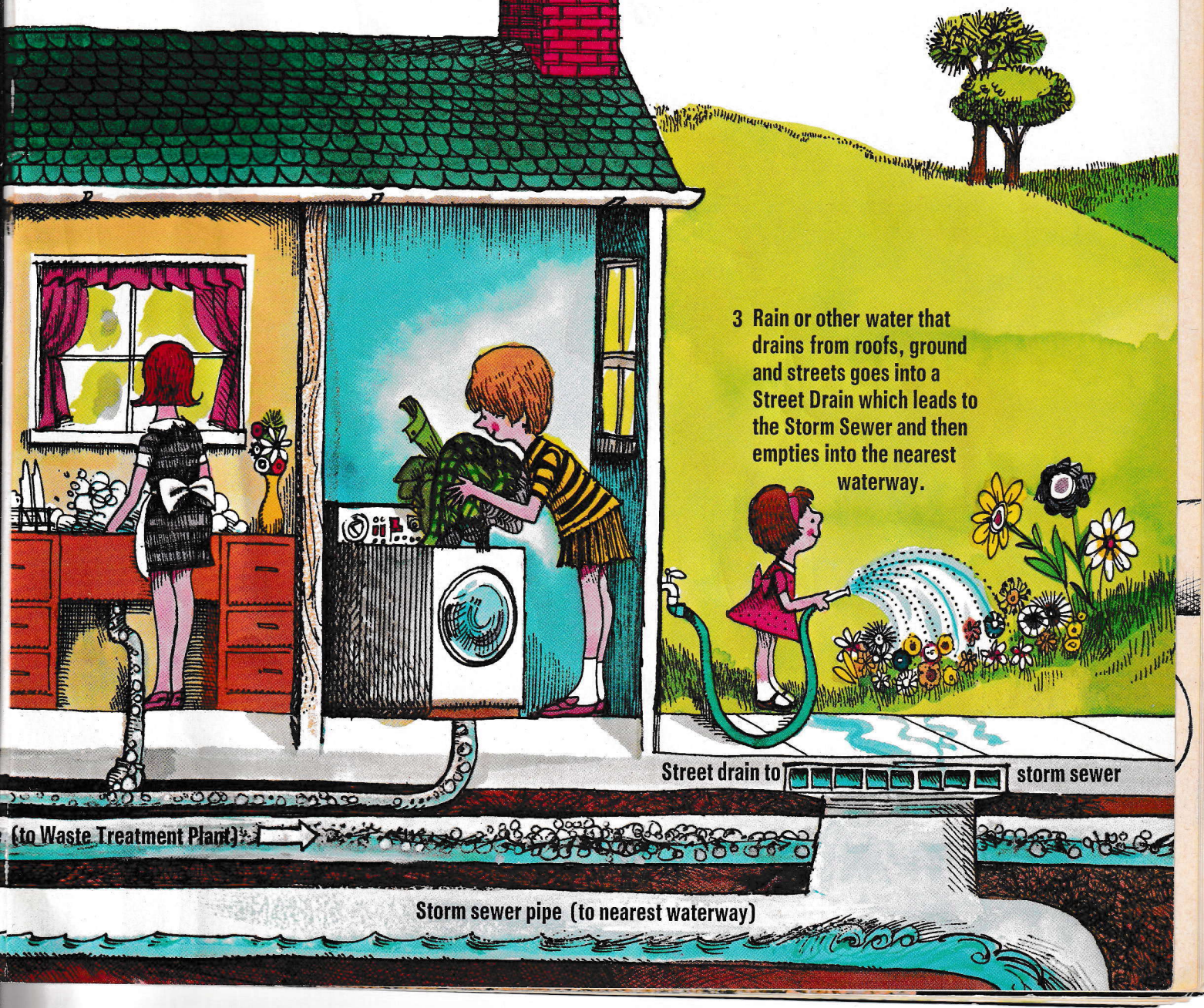
Nowadays most communities give off too much waste material for nature to handle alone. The dirty water must be cleaned BEFORE it goes back to the waterways. Has your community a waste treatment plant?

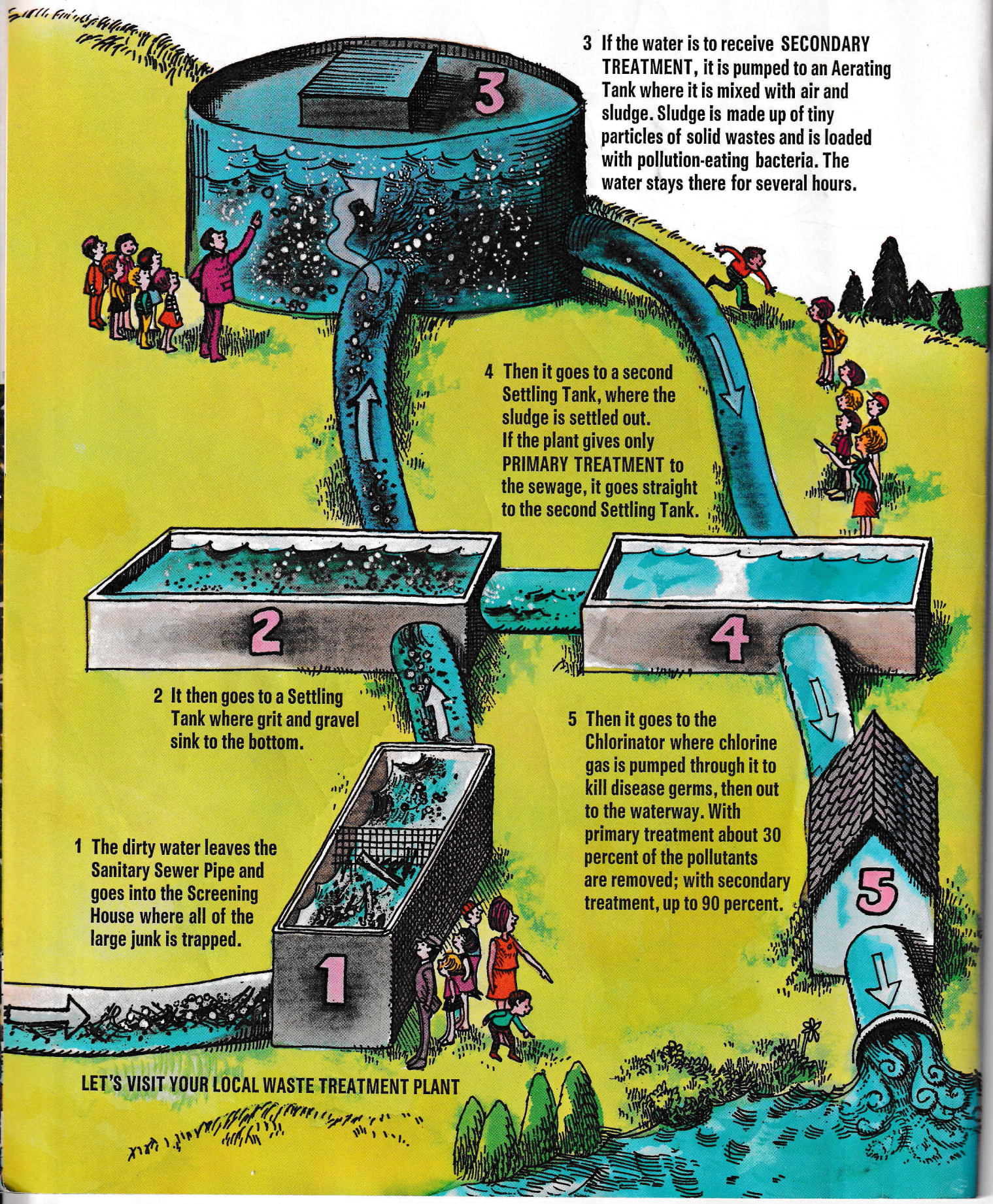
The picture on page 32 shows how waste water can be given two stages of treatment called *primary* and *secondary*. These remove many of the pollutants. Some that remain may be destroyed in waterways. But some of the chemicals are not removed.

Tertiary, or third-stage, ways of treating water are being tested. These too will be needed as population grows and factories and power plants produce new forms of pollutants, including radioactive wastes.

People everywhere will have to know more about ways of treating waste water so they can tell whether the local methods are good enough. To learn more, send 55 *cents* to the *Superintendent of Documents, U.S. Gov't. Printing Office, Washington, D.C. 20402* for *A Primer on Waste Water Treatment.*

Please turn the page


3 Rain or other water that drains from roofs, ground and streets goes into a Street Drain which leads to the Storm Sewer and then empties into the nearest waterway.
Street drain to
storm sewer
(to Waste Treatment Plant)
Storm sewer pipe (to nearest waterway)



3 If the water is to receive SECONDARY TREATMENT, it is pumped to an Aerating Tank where it is mixed with air and sludge. Sludge is made up of tiny particles of solid wastes and is loaded with pollution-eating bacteria. The water stays there for several hours.

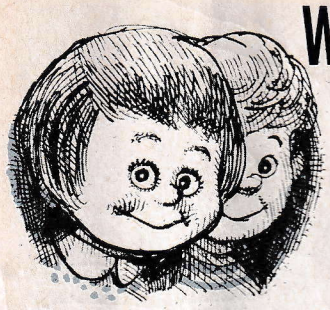
4 Then it goes to a second Settling Tank, where the sludge is settled out. If the plant gives only PRIMARY TREATMENT to the sewage, it goes straight to the second Settling Tank.

2 It then goes to a Settling Tank where grit and gravel sink to the bottom.

5 Then it goes to the Chlorinator where chlorine gas is pumped through it to kill disease germs, then out to the waterway. With primary treatment about 30 percent of the pollutants are removed; with secondary treatment, up to 90 percent.

1 The dirty water leaves the Sanitary Sewer Pipe and goes into the Screening House where all of the large junk is trapped.

LET'S VISIT YOUR LOCAL WASTE TREATMENT PLANT



What can you do?

Notice the ways you use water around your home. How much water is used to wash the family car? Get a watch with a second hand. Time how long it takes to fill a one-gallon bucket with water from a hose. Use the same hose pressure that is used when the car is being washed. Now time how long the hose runs while the car is being washed. What was the number of gallons used? You can see why it is a good idea, in dry seasons, to use water in a bucket to wash cars instead of running it from a hose.

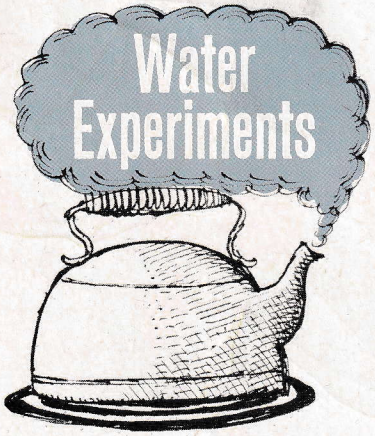
Water is too valuable to be wasted. Even a leaky faucet losing one drop of water each second wastes 4 gallons of water a day. Be careful to close faucets tightly.

Here are some other ways to save household water and you can probably think of many more:

Don't let the water keep running continuously from the faucet while washing dishes or brushing your teeth. Don't run water just to get a cool drink. Instead, keep a container of water handy in the refrigerator. Sprinkle lawns and gardens in the early morning or evening. Less water is lost at these times. Heat from sunlight causes water to change to water vapor and rise into the air *(evaporation)*. During the daylight plants lose water vapor into the air around the plants *(transpiration)*. A good way to see this is to tie a clear, plastic bag around a small leafy branch. What happens inside?

Now that you know much more about water—its uses and misuses—how many ways can *you* think of to use water more carefully?

You might start a project at school to find out whether your community is polluting its waters. See what steps are being taken to stop it. See if you can get your parents, neighbors and teachers to help solve pollution problems.

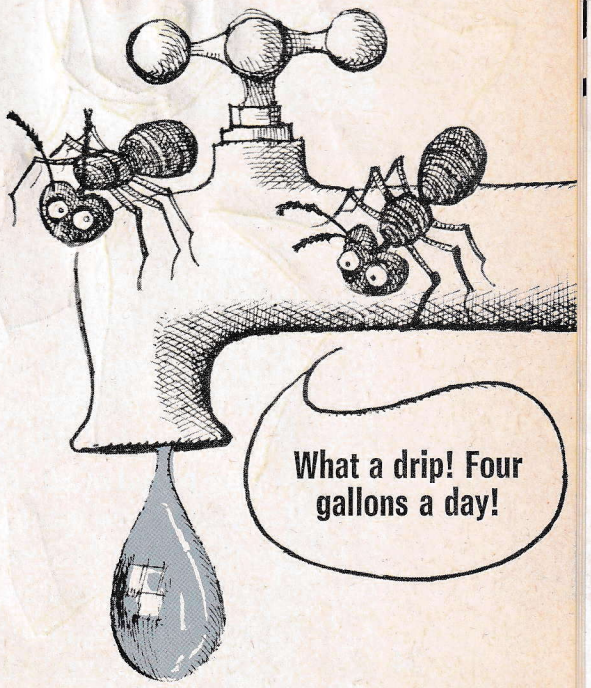


SEWAGE TREATMENT. Obtain a dime-store flour sifter or make a container with a screen bottom. Cover the screening with a layer of absorbent cotton, next a 1-inch layer of fine sand, a 1-inch layer of coarse sand, and then a 1-inch layer of gravel. Set the sifter over a jar and slowly pour muddy water into it. Does the water look clean when it comes out the bottom? *While the water may look clean, it still contains germs and should not be drunk!* Compare what you did in this experiment with the way sewage or wastes are treated in regular treatment plants.

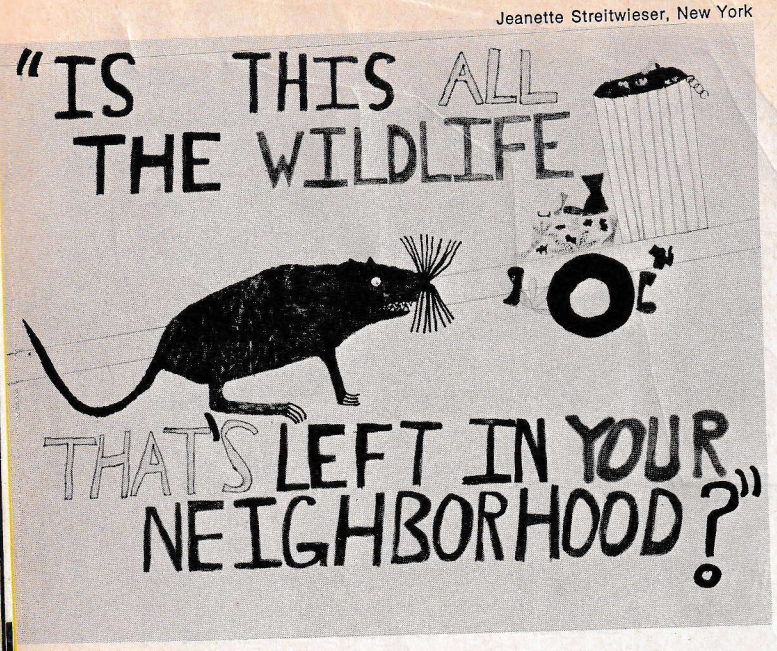
TASTE. Pure water is tasteless and is not often found in nature. Water gets its taste from minerals and oxygen in the air that are mixed in with water. Test to see the difference in taste between water with air in it, and water that is *flat*, or has little air in it. Boil a cup of water to force out the air. Taste some of it when it cools. Note the taste. Now pour the remaining water back and forth ten times from one cup to another. Taste the mixed water. Any difference?

SMELL. Collect separate fresh cups of water from a faucet, a swimming pool and a pond or lake. Smell each quickly. Do they smell different? How do you explain your observation?

"HARDNESS." Water is said to be hard when it contains large amounts of minerals such as calcium and magnesium. Look for signs of hard water around your home, such as a bathtub ring, spots on glassware, a whitish deposit in pans, red or brown stains on clothes, soap scum on wash water. Hard water can cause your hair to look dull and matted too. Knowing the signs of hardness, can you make up a test to tell if the water in your house is hard? Are there chemicals that will make hard water "soft" (free of hard minerals)? *The End*



Jeanette Streitwieser, New York



Maria Spivey, Illinois

Dear Ranger Rick
Box 2299
Phila., PA. 19103

HI, RANGERS!
Way back in March we suggested that you make posters for National Wildlife Week, put them around your neighborhood, and then send them to us to see.
Wowee! We were swamped with posters. If we printed nothing but posters in the magazine for the next six months, we still wouldn't get them all in. So we had some poster experts pick just a few to be shown. We are proud of all of you for the fine posters you made. We can see that they must have helped many people to become more aware of the huge environmental problems we have. Congratulations!

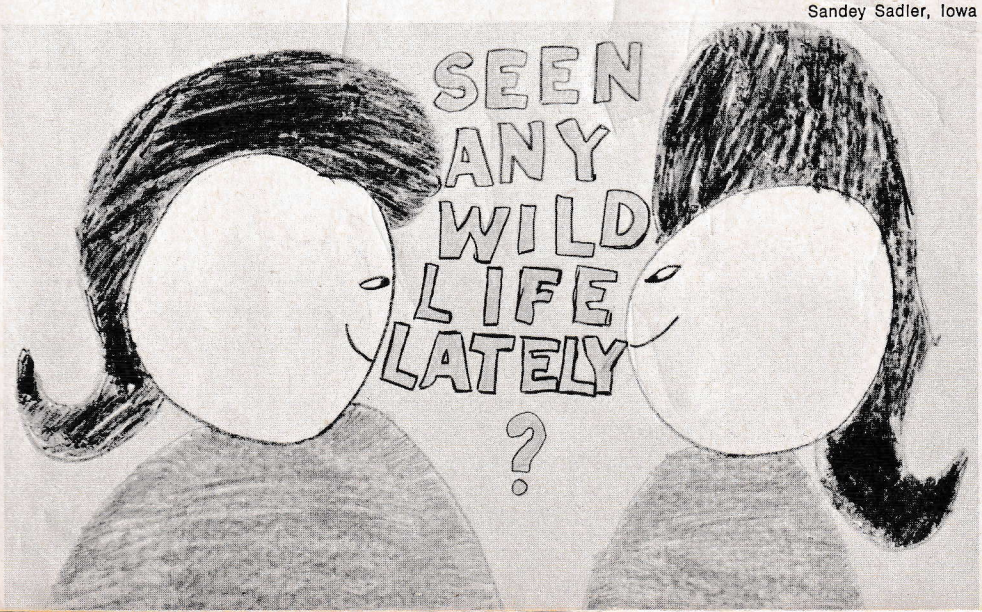
Ranger Rick

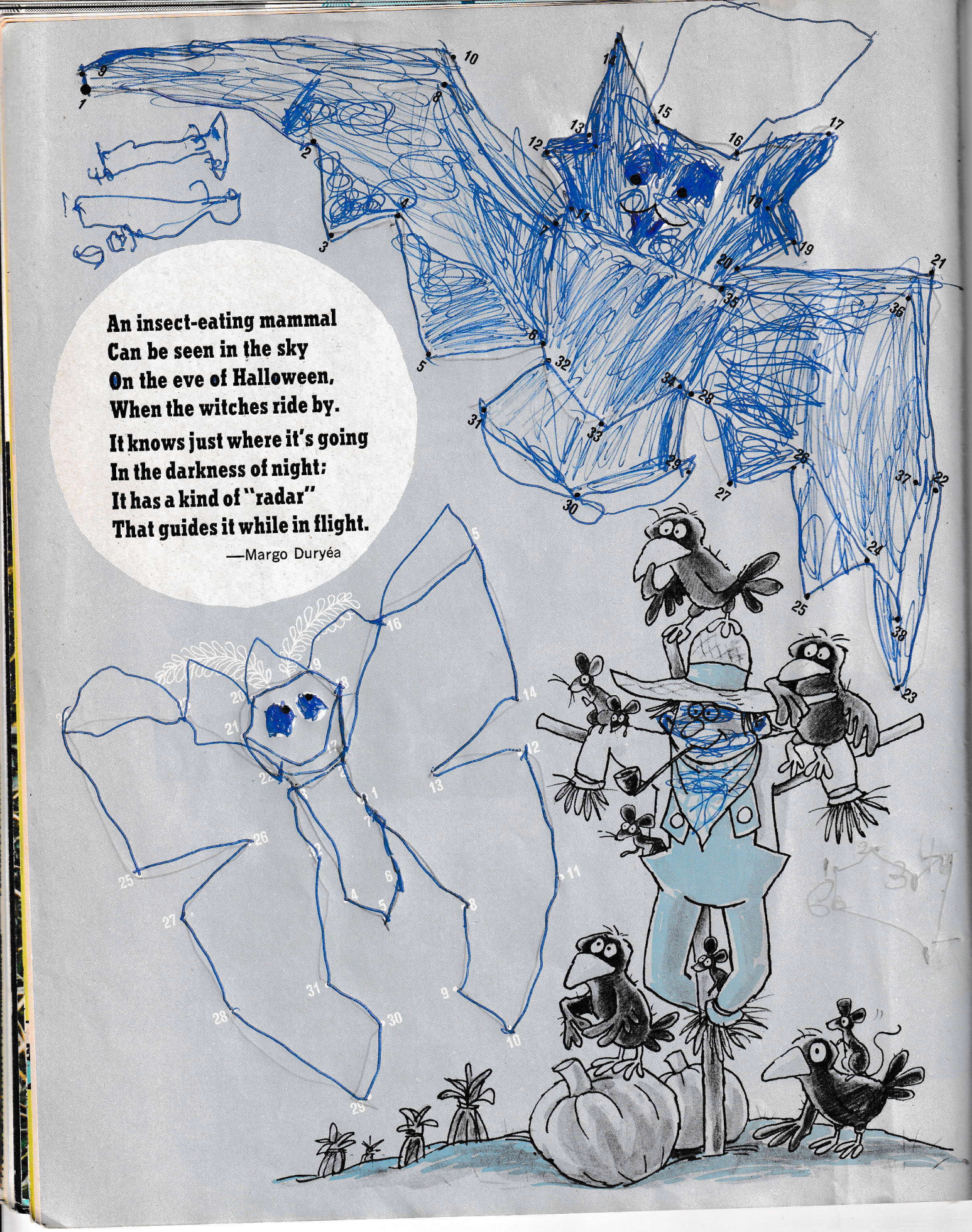
Mark Wiens, Kansas

Mark Miller, Kansas

Heather Law, Illinois

Sandey Sadler, Iowa





An insect-eating mammal
Can be seen in the sky
On the eve of Halloween,
When the witches ride by.
It knows just where it's going
In the darkness of night:
It has a kind of "radar"
That guides it while in flight.

—Margo Duryéa

Why Run?

Used with permission from SCARY THINGS by Norah Smaridge. Copyright © 1969 by Abingdon Press.

Jane won't touch a caterpillar,
Mary's frightened of a mouse,
Sally shrieks and runs for Daddy
When a moth flies in the house.
Pam's afraid of shiny beetles,
Spiders make Melinda squirm,
Susan nearly has HYS-TER-ICS
If you chase her with a worm!

Drawings by Ruth VanSciver

Aren't they foolish to be frightened?
Fancy making such a fuss
Over harmless creepy-crawlies
Who are scared to death — of US.

NATURE CLUB NEWS

Monthly Awards

Pennant for Neighborhood Club with Most National Members: "The Nature Navigators" of Clearwater, Florida.

Certificate of Merit for School Club with the Most Members: The first-grade class of the American Community Schools, Athens, Greece, with 55 members.

Pennant for Best Club Project: "Wildlife Outdoor Club of Cedar Rapids and Marion, Iowa."

Club News From Iowa

Mr. Harry Hittie is the adviser of the Wildlife Outdoor Club. There are 7000 members in the club. They are all children in the Cedar Rapids and Marion, Iowa, area.

On February 1, 1968, Mr. Hittie first appeared on *Dr. Max,* a children's television program in Cedar Rapids. He talked about Ranger Rick's Nature Club and the National Wildlife Federation.

Since then he has been on the program several other times. He also travels to schools, Boy and Girl Scout troops and camping groups in the area. He talks to the students about *Ranger Rick.* The children call him "Mr. Ranger Rick."

Mr. Hittie has designed and printed a membership card for his local club, which includes the Ranger Rick Pledge. He distributes cards to all the members of his club. He encourages the club members to help keep their parks, rivers, streams and lakes clean. He shows them how they can start by picking up litter around their desks and schoolyard before they go home. They can do the same at parks and along local waterways. Litterbugs should be reported to local officers. If members see anyone littering from a car, they are encouraged to take the license number and report it to the authorities. No one is too young to be a pollution detective!

Mr. Harry Hittie advises a club of 7,000 members who call him "Mr. Ranger Rick"!

Club Activities

Every day we receive letters from our club members asking, "What can we do at our club meetings?" We hope you have been reading "Nature Club News," where you will find some of the projects and activities that Ranger Rick clubs all over the world are doing.

One thing that stands out in the articles about successful clubs is that they all seek the help of their adult adviser. Why not ask yours? I'm sure he or she will have many good ideas to make your club meetings more interesting and fun.

An adult supervisor can contact local and state conservation commissions for free conservation films. If you are not in a class club, perhaps you or your adviser could work with your schoolteacher in borrowing visual aids from the school for some of your meetings. Nearby colleges will usually help too.

Don't forget one very important source for club activities—your RANGER RICK'S NATURE MAGAZINE. Each issue contains things to make and do which will provide your meetings with hours of fun. Also, many of the articles themselves suggest projects or activities to help you learn more.

Try some of the projects suggested in the article on water beginning on Page 26. How much did you learn about water? Perhaps you could report your findings to your school class sometime when you're studying water.

Just for fun, try to guess the answers to the riddles on Page 14. See which member can answer the most the fastest.

by Ross Phares

When The Food Runs Out

The butcher bird kills a mouse and hangs the carcass on a tree branch for later use. Animals do such unusual things . . .

Have you ever wondered what life would be like without refrigerators and cans and jars to preserve the food you eat? With these inventions you can have almost any kind of food you like at any time. But how do you suppose the other members of the animal kingdom, who have no such means, manage in seasons when there is no food? They do amazing things in order to eat.

Can you think of any other animal that "butchers livestock" as do human ranchers? The **mole** does. He "rounds up" earthworms, bites their heads off, then stores them. As many as a thousand earthworms have been found in a mole's "stockyard" at a time.

The **skunk** has been known to use a similar method to keep meat handy "on the hoof." It bites small game, such as toads and frogs, through the head. This paralyzes them, though they remain alive. A mother polecat with a family was found to have forty frogs and two toads in an enclosure near her den. This is an unusually big supply.

The **mud dauber wasp** goes a little farther than just paralyzing its prey with a sting. It uses something like "vacuum packing"! Have you ever examined the mud apartments of these insects? Instead of daubers, you will find many spiders and small insects sealed inside them. This fresh "meat" will serve as food for the mud daubers' larvae when they hatch from the eggs laid by the adult.

The **weasel** doesn't seem to know how to preserve live meat. Instead it stores slaughtered animals in pits covered with earth. In one weasel's pit forty-four mice and a couple of magpies were found. They were packed one above the other separated by layers of earth. This keeps air from reaching the carcasses and they remain edible.

Most **ants** also use the ground for a storehouse. There they dig out "rooms" and store vegetation, including seeds. But sometimes water floods their underground bins and there may be no other food available. So, on the first dry day, the ants haul the wet food up to the surface to dry it out and keep it from spoiling. Then when it is dried they take it back to the "bins."

Please turn the page

Photo by Hugh M. Holliday from National Audubon Society

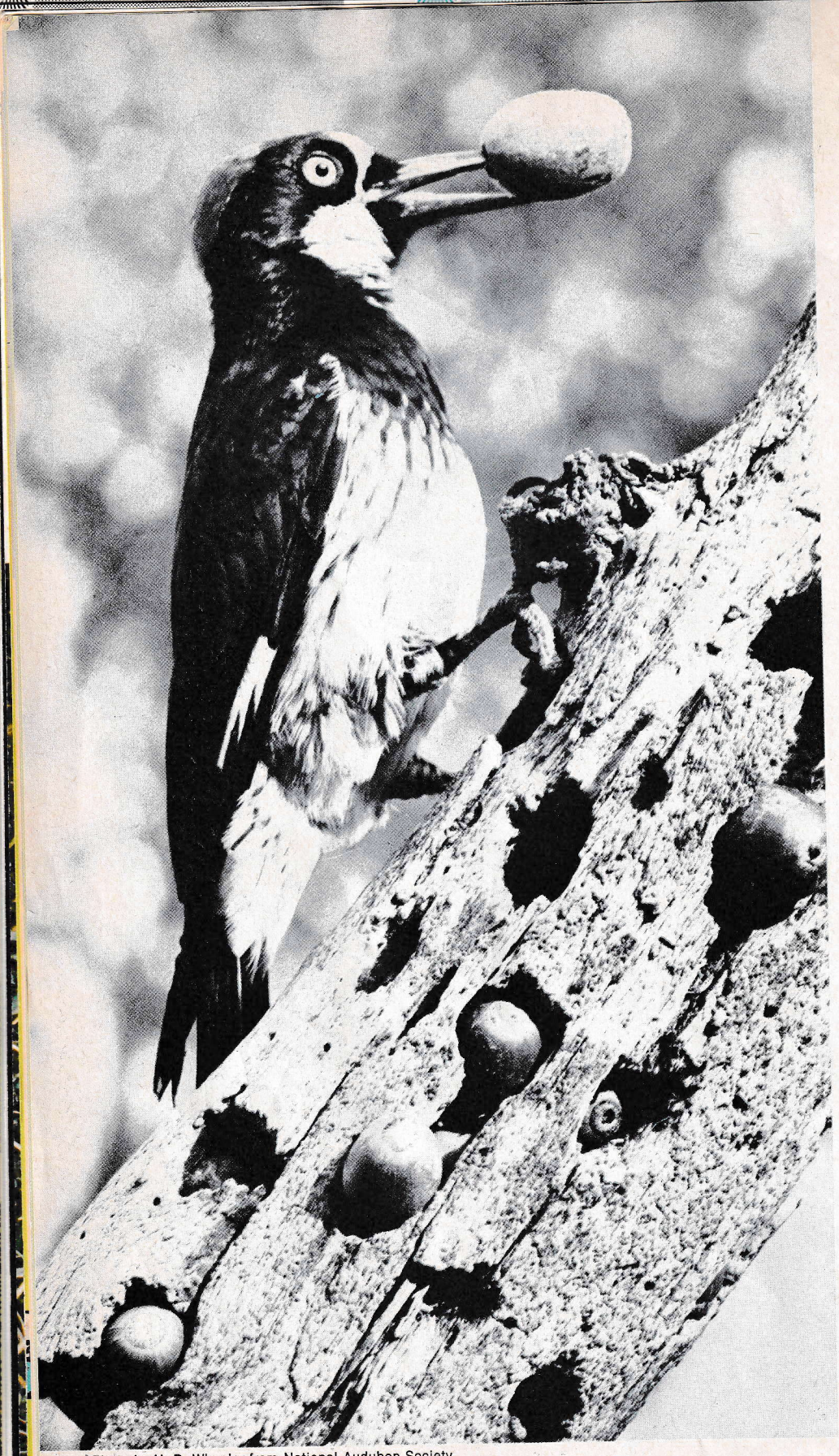


Photo by H. D. Wheeler from National Audubon Society

One of the most surprising things ants do is "**live** packaging." The worker ants build special rooms and confine some of their members in them. Then they collect honeydew and pump it into the imprisoned ants until their abdomens stretch to the size of big peas. Later, when the food outside is gone, the hungry ants go to their living "honey pots" for a meal. They stroke them gently under the chins. This causes the stuffed ants to regurgitate (throw up) the preserved food. It must be delicious because in some parts of the world children dig up these ants and eat them for dessert!

The little **pika** of the western U.S. mountains lives on hay during the winter when the green grass he likes so well is dead or covered with snow. He is as expert as any farmer at making hay. In the summer or autumn, when the grass is lush, he cuts it with his sharp front teeth. Then he spreads it out to dry in the sun. When it is cured just right for him he starts storing it under the ledges of rocks. He works very hard at carrying long bundles of hay in his mouth. He piles layer on top of layer until he builds a haystack, just as farmers do. Like the ants the pika knows how to save his winter's store if water floods it. He takes the hay out and dries it, then restores it.

Some animals, like **squirrels** and **jays**, seem to have an easy time providing for winter. You may have seen them carrying nuts and acorns to a hollow tree or log and putting

Acorn woodpecker pecks holes in tree and stuffs them with acorns to eat during the winter. (Sometimes it forgets a few!)

Photos by Ross E. Hutchins

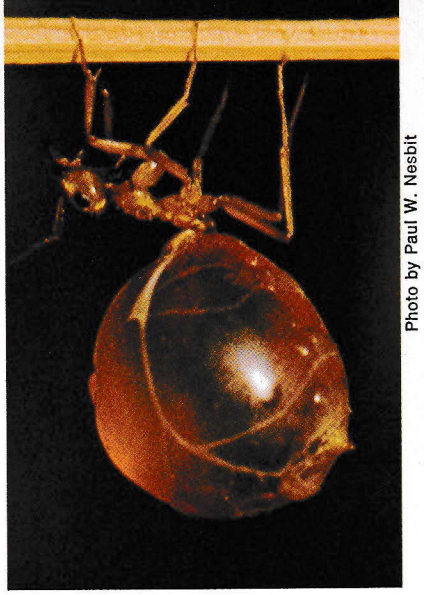


Photo by Paul W. Nesbit

Worker ants gather honeydew and pump it into imprisoned ants, stretching their abdomens (above). Later, hungry ants stroke "honey pots" for a meal.

Harvester ant (below) carries a dandelion seed to its nest. Ants (left) store many seeds in special chambers until needed.

them away there. What may surprise you is the great amount of food they store, as if they know enough not to take any chances on going hungry. Their caches often amount to many bushels. The burrow of a little ten-inch **kangaroo rat** was found to contain nearly fourteen bushels of seeds and other food!

Sometimes squirrels and jays bury acorns and nuts, one at a time, over a large area. Luckily, they sometimes forget where they have left these hundreds of items, for that is how some trees get started. The California acorn-storing **woodpecker** pecks small holes in trees, and then packs acorns into the holes. One giant pine tree was found to have about 50,000 acorns buried in it.

Crows and **rooks** bury nuts in manure, which helps to preserve them and keeps them from freezing.

The **butcher bird** handles its meat differently. After killing its prey—birds, mice, lizards and the like—it hangs them on thorns and twigs much as a farmer hangs meat in his smokehouse. Then it rips the meat into pieces with its sharp beak. When the young birds hatch and a lot of food is needed, there it is hanging close by the nest, provided there has been no thievery!

You may have wondered how the animals of the frozen North survive the long, bleak winters. They turn what seems a disaster into a life-saving convenience. Like most animals they use the means they have

The pika (top) cuts and stores grass in layers making a haystack. The beaver (right) keeps his food supply of small trees underwater near his lodge.

Photos by Harry Engels (top); Willis Peterson

Photos by Wilford L. Miller (top); Karl Maslowski

Red fox (left) buries a dead pheasant in cold storage under the snow. The least weasel (bottom) in winter fur will store dead mouse underground.

handiest—"cold storage." **Polar bears, wolves** and **foxes** store their extra meat on the frozen ground or in the snow. It is safe from spoiling in this deep-freeze.

A brightly colored lizard of the United States called the **Gila monster** has an unusual way of living through famine. It stores food in its tail. It eats heartily when food is plentiful, until its tail grows very large and fat. The store of fat in its tail enables it to live for months without eating.

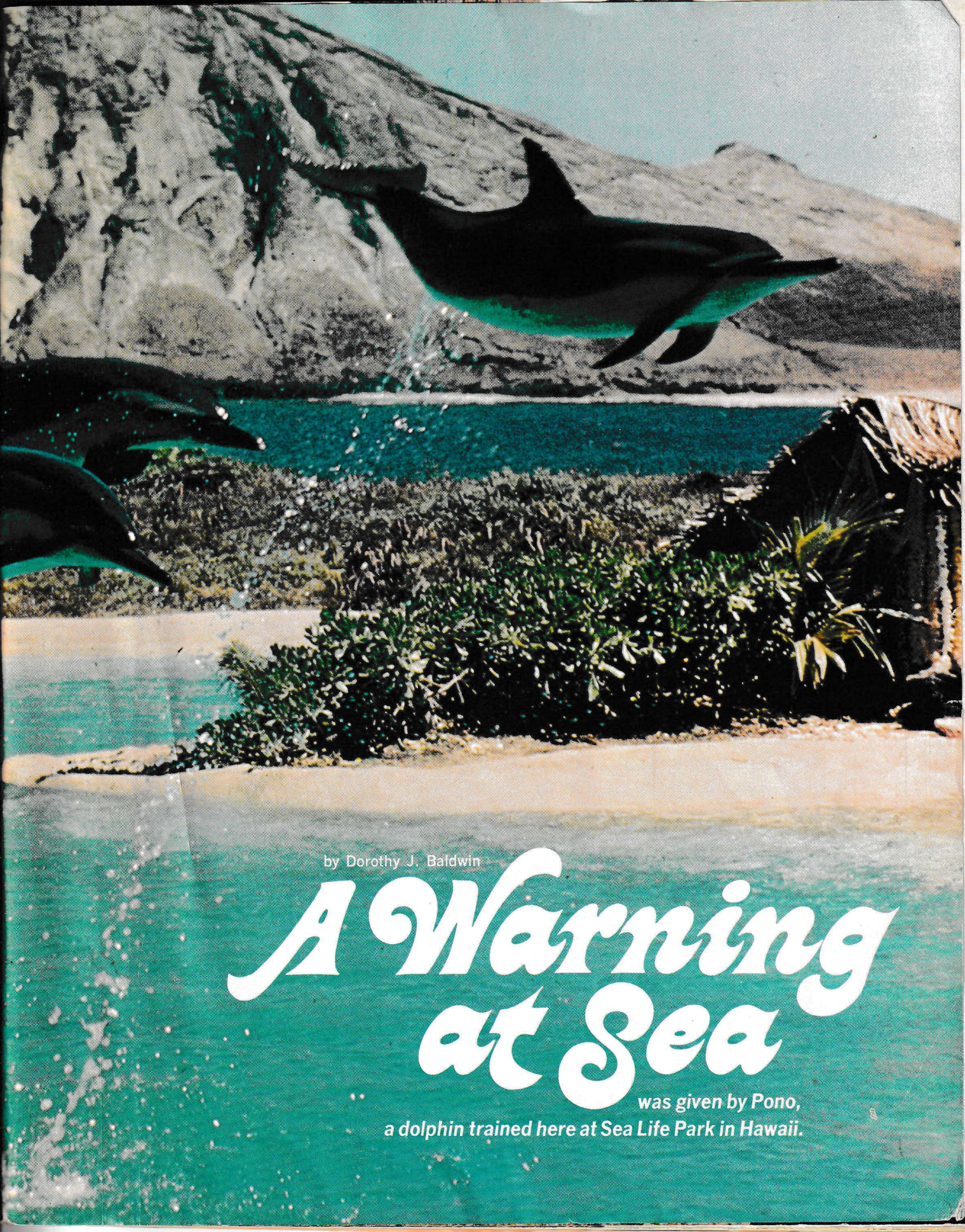
The snakes known as **boas** have what amounts to a built-in pantry. They sometimes swallow animals as large as goats or deer after squeezing them to death. With such a big meal and very slow digestion the snake can go as long as six months without any more food.

Some animals have to store food because of their enemies, just as people have to store scarce materials in time of war. **Sea turtles** feed on sea plants in shallow water. But sometimes it is too dangerous for them to eat there. So when it is safe they cut up sea plants and mix the pieces with mud. Then they roll the mixture into balls and float them out to sea to eat in safety when there is a shortage of food.

So you see, we humans aren't so clever to have thought of refrigeration and freeze-drying and curing to prevent food from spoiling Other animals have been using the same methods for who knows how long!

The End

Photo by Russ Kinne; Photo Researchers, Inc.



by Dorothy J. Baldwin

A Warning at Sea

was given by Pono, a dolphin trained here at Sea Life Park in Hawaii.

Training an animal can be a lot of fun as well as an exciting and rewarding experience. I started training dolphin in Hawaii five years ago at an oceanarium called Sea Life Park.

This park is different from most oceanariums. Only half of the area is used for shows for the public. The other half is used for research. In the research area, dolphin are trained so we can study their intelligence and find out how well they can hear, how fast they can swim and how deep they can dive.

The amount of time it takes to train a dolphin depends on the skill of the trainer and the intelligence of the dolphin. Like people, some dolphin learn faster than others. Only the most intelligent animals are chosen for research work.

When a new dolphin is first brought in from the ocean, it is fed all the fish it wants. In this way we learn how much food the animal will eat. If this is continued for too long, the animal becomes fat and lazy. So after about a week the amount of food is reduced.

The next step is to teach the animal that the sound of a whistle means a fish to be eaten. A whistle is blown and a fish is immediately thrown into the tank. Soon the dolphin looks around for a fish every time he hears the whistle.

The dolphin is then trained to do a task such as pressing a lever that causes a bell to ring. It is rewarded with the sound of the whistle and a fish each time it obeys.

A fish is not the only kind of reward. The greatest reward is the trainer's attention and companionship. Since dolphin are playful they enjoy games with their trainer. They play ball, dive deep in the water and race the trainer to the far side of the tank. Many times a dolphin tried to stop me from leaving the tank. It got between me and the wall.

Of all the animals I worked with, my favorite was a dolphin named Pono. She was intelligent, playful and eager to please. From the day she arrived, she was everyone's favorite. Pono learned quickly. She had been trained to return to an underwater recall signal—a steady buzz made by a *hydrophone*.

After just five months of training, Pono was ready to work at sea. Her mission was to dive down to a cylinder which had a lever on either side and to press one of the levers. The cylinder was slowly lowered to different depths by a long rope attached to the boat. When the lever was pressed, a buzzer sounded so that Pono knew she had acted correctly and could swim back to the surface to receive her reward — a fish. At the same time the buzzer sounded, a bell rang aboard the boat so I knew how deep Pono had dived.

To get out to sea from her training tank, Pono was transported by truck to the bay, carried to the water and put in. She was stiff from the long journey in one position, and it took a while for her to start swimming. During this time, I helped Pono and walked her around the shallow water.

Then came the moment to release her and let her swim along with the boat into the open ocean. But she refused to go! She

wouldn't even move unless I was right beside her. So, side by side we swam out to sea.

After a while she became used to and seemed to enjoy her freedom. During lunch breaks she dove to the bottom of the bay and brought up bits of seaweed on her fins. Once she found a bologna skin from a sandwich and surfaced with it looped around her nose!

If she thought we were late getting started in the morning she would bob her head above water, peering at us, or leap and make a mighty splash. She often gave me rides through the water while I held onto her dorsal fin.

The second and third days she was taken three miles offshore for the diving work. Down she went—100 feet—110—125.

Late the third day Pono began acting strangely. She raced up and down and from one side of the boat to the other, as if very nervous. I got into the water hoping to calm her by swimming with her. At the same time I was thinking, *I never expected to be swimming in these shark-filled waters.* But Pono didn't want to play. Instead, she came and hit me hard in the stomach with her rostrum (beak). With slightly hurt feelings, I left the water saying, "If you don't want to play, I'll get out!"

Pono was our favorite dolphin. She always wanted to play and was so eager to please.

Then we saw them—five large, shadowy figures coming from beneath the bow of the boat! They were man-eating sharks, one a good 13 feet long! There was nowhere for Pono to go—no place for protection except the vast wide sea. She had no other chance. With a leap she was swimming out to sea, racing for her life.

The shadowy figures disappeared. When night came, we went to bed, but there was little sleep.

The following day we radioed all ships that our dolphin had disappeared—to please watch for her. Almost immediately a ship radioed back. Pono had been near them for almost fifteen minutes, but had just left. But by the time we got there she was long gone.

For the next month we got reports of fishermen or swimmers who had seen her. Had it really been Pono or just some other curious dolphin? About a month later our collecting boat came across the dolphin school from which Pono had first been taken. The buzzer system was lowered into the water and turned on. To everyone's joy and relief, one animal left the school and came toward the boat. No one doubted that it was Pono. Somehow she had found her way back to the school. We left her with the other dolphin, perhaps with good memories of her brief time with humans.

As for me, I was left with the memory of a true and faithful friend, one who had probably saved my life by her warning at sea.

The End

Rangers: Pono is a mammal of the order Cetacea. *For more about this order, see R.R., July, 1969, Pages 12-15.*